ANNUAL REPORT

OF THE

BOARD OF HEALTH

OF THE

CITY OF PITTSBURGH,

FOR THE YEAR

1879.

PITTSBURGH, PA.
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1880.

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BOARD OF HEALTH,

1879.

J. F. SLAGLE,	PRESIDENT.
W. J. ASDALE,	SECRETARY.
ADDISON ARTHURS,	TREASURER.
T. P. GRAHAM,	
J. D. THOMAS,	
JAMES McCANN,	
N. S. BROKAW,	
JARED M. BRUSH,	
*R. M. McCLARREN.	

EXECUTIVE OFFICERS.

CROSBY GRAY,	HEALTH OFFICER.
W. SNIVELY,	PHYSICIAN AND REGISTRAR.
H. H. McCORMICK,	ATTORNEY.
T. W. LINDSAY,	MEAT INSPECTOR.
J. GEARY LOGAN,	REGISTRATION CLERK.
J. J. LAWSON,	SANITARY INSPECTORS.
GEO. W. BRACEY, JR.,	
CHARLES HAVIS,	
W. C. McCORD,	
F. C. O'BRIEN,	

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*Vice W. W. LOGAN, deceased.

COMMITTEES

1879.

J. F. SLAGLE,	*Finance.*
J. D. THOMAS,	
JARED M. BRUSH,	
W. J. ASDALE,	*Sanitary.*
N. S. BROKAW,	
T. P. GRAHAM,	
JAMES McCANN,	
R. M. McCLARREN,	
A. ARTHURS,	*Municipal Hospital.*
T. P. GRAHAM,	
W. J. ASDALE,	
JAS. McCANN,	
JARED M. BRUSH,	
J. D. THOMAS,	*Printing.*
A. ARTHURS,	
R. M. McCLARREN,	

OFFICE OF THE BOARD OF HEALTH,
MUNICIPAL HALL,
Pittsburgh, January, 1880.

To the Select and Common Councils of the City of Pittsburgh:

GENTLEMEN:—The Board of Health herewith respectfully presents for your information the annexed Annual Reports of their Treasurer, Health Officer, Registrar, Meat Inspector and Attorney, which contain a brief account of the operations of said Board during the year 1879.

We also desire to direct your *special* attention to the appended report of the special committee appointed to investigate and report upon the typhoid fever epidemic, which appeared on the South Side during March of the present year.

Respectfully submitted,

J. F. SLAGLE,
President.

W. J. ASDALE,
Secretary.

HEALTH OFFICER'S REPORT.

Office of the Board of Health,
Pittsburgh, *January*, 1880.

To the Board of Health:

Gentlemen :—I have the honor to submit the following report for the year 1879:

I regret that I am called upon, as on two former occasions, to preface my report by a reference to the fact that the "Destroyer" has again appeared in our midst, and, as a result, to chronicle the death of Col. W. W. Logan, which occurred on the 18th of June, last. Col. Logan became a member of this Board by election on February 1st, 1877, and had consequently served a little more than two years in that capacity. Although an invalid for several months immediately preceding his death, he yet attended the regular meetings of the Board whenever it was possible to do so, and at all times evinced a lively interest in sanitary affairs, and by his good judgment, kind advice and genial temperament, endeared himself to all with whom he was connected, and who sincerely mourn his loss.

General Sanitary Condition.

The sanitary condition of the city compared favorably with that of former years, although not by any means up to the proper standard. During 1879, 2,923 deaths occurred, a decrease, as compared with those of the previous year, of 145. Of this number, 761 (almost one-fourth) were due to preventable causes, being 204 less than during 1878. This, while exhibiting some improvement, still shows that the mortality from these causes was much too great. Among the causes which should be specially mentioned, as responsible for the large mortality, are the unsatisfactory character of the sewerage in some portions of the city, and the want of a complete and systematic method for the removal of garbage, offal, &c. The latter defect, I trusted, would have been remedied long ere this, but although repeatedly referred to, and several attempts made to do so, the old and very objectionable plan of its disposal still exists. As is well known, fully one-half of this material is deposited upon the public streets, alleys and vacant lots, under cover of darkness, and the balance, when mixed with the daily accumulation of ashes, is removed from the premises by some one of the many irresponsible persons engaged in the business, to a little less dangerous place in some street-fill or ravine, where material is required to conform the locality to the grade of the surroundings. That such material cannot be safely used for this purpose, nor deposited anywhere in a thickly settled neighborhood, is obvious to every one, and it therefore becomes an absolute necessity to provide for its proper and prompt removal to some safe place of deposit.

This subject is one which gives this Board and its officers more trouble and annoyance than almost any other. It is impossible for us to place an inspector in charge of every vacant lot, or other place, where the material is deposited, and we are, therefore, compelled to require the owners of the property to abate the nuisance by removal. To this requirement, many of them strenuously object, claiming that they pay high tax rates, and are entitled to protection, and that it is impossible for them to prevent such trespass This argument is certainly, to some extent, just, but as this Board is not enabled to provide for the proper disposition of such material, it is compelled to hold the property owners liable, however unjust such a measure may appear. I still have hope, however, that this problem will be properly solved during the coming year, as an ordinance is about to be presented in City Councils authorizing this Board to have all such material removed by contract.

The subject of drainage and sewerage is one which has long engaged the attention of sanitary authorities and scientific men, and may continue to do so for many years before it is properly solved. The old system, by which provision was made for the reception of the soil drainage, the waste from dwellings, as well as the storm water, is being discarded by the best sanitarians as being impracticable. Gen. Egbert L. Veile, one of the best sanitary engineers in the country, says:

> "Drainage and sewerage are entirely distinct, and can seldom be combined, and then only to a limited extent. Drainage is the removal of surplus water from the soil; sewerage is the removal of water introduced by means of an artificial water supply, to which is added excrementitious and other refuse matter, which the force of the water conveys into the sewers. It follows that sewers should be close conduits, to prevent the escape of gases, while drains should be so constructed as to admit of the percolation of water into them from the adjacent soil. It is imperatively necessary that the streams and water-courses should be preserved by underground drains, and also that lateral drains should be constructed to take up the water emanating from perennial springs. If this is not done in the beginning, when it can be done easily and economically, it will have to be done in the end, when the task is surrounded with difficulties, and at an enormous cost, when the safety of the lives of the people demand it, and after the pestilence and the cemetery have demonstrated its absolute necessity."

The principal points to be considered in the preparation and construction of a proper system of sewerage, he says, are:

"1. The original configuration of the ground, and natural valleys of drainage.

"2. The artificial changes of the natural surface by the grading of streets and filling in on low ground.

"3. The rainfall, or amount of water discharged from the clouds during the year upon the area to be sewered.

"4. The water supply, or amount of water distributed to the inhabitants daily from the reservoir and water works.

"It will be seen that the surface drainage of graded streets is included in the sewerage system, but this is distinct from the natural drainage through old water-courses, from springs, etc. The imperfections in a system of this kind arise from a want of proper judgment in determining the size, form and location of the sewers; sometimes from errors, either intentional or accidental, in their construction; and sometimes from want of proper material used. But one of the chief causes of trouble is a want of proper descent to allow a free flow of the sewage."

Col. Henry Flad, an eminent engineer, and President of the Board of Public Works of St. Louis, in a communication to a gentleman of this city, says: "My theory is, that to supply a city with plenty of water without, at the same time, providing sewers, is the greatest blunder that can be made from a sanitary point of view. * * * The dilution of the sewage in the cess-pools by the use of hydrant water causes it to permeate the ground around them to a great distance, and there is no surer way to produce typhus than to have the ground around houses saturated by sewage. * * * When typhus prevailed in Munich some years ago, the cause was discovered to be principally in the use of cess-pools, and the parts of the city which have since then been sewered have become healthful. In Heidelberg, * * * * Dr. Carl Mittermaier studied the causes of the often-repeated typhus epidemics, and found them in the cess-pools and antiquated, badly constructed sewers. * * * * Urge the construction of sewers, if you want your city healthful, and don't think of building them *on the old costly plan of carrying storm-water and sewage in the same conduit.* Make the sewers of pipe just large enough to carry the sewage alone, and let the storm-water run off, if possible, in the gutters. It is almost incredible how much sewage can be removed by 4, 6 and 8-inch pipes. Then you have sewers that cost very little, that are kept clean by the constant flushing from the hydrant water, and that will, therefore, not retain any sewage matter long enough to allow it to undergo fermentation; and it is only by fermentation and decomposition that sewage becomes dangerous to health."

The testimony of many other eminent sanitary engineers might be added.

The lack of proper sewerage is very noticeable in the South Side wards, which locality is almost always suffering from some one of the diseases due to, or at least propagated by such unsanitary conditions, as above noted. Prior to the annexation of that district to the city, which occurred in 1872, it was governed by some half dozen or more little municipalities, each of which had its own code of laws, and administered its sanitary regulations to suit itself regardless of its neighbors. Consequently, at least so far as sanitary affairs were concerned, the management was bad. What with the unsystematic location and faulty construction of sewers, the filling of lowland with ashes, garbage, and other refuse, the tapping and covering up of privies, to avoid the cost of cleaning, and other equally bad management, is it any wonder that this locality is a very inviting one for disease? That such is the case, a reference to the record of the past five years is sufficient.

The percentage of mortality from infectious diseases during those years, in the different districts of the city, is exhibited in the following statement:

DISTRICT.	1875.	1876.	1877.	1878.	1879.
Old City, - - -	25.5	18.8	27.7	28.1	22.8
East End, - -	29.3	17.6	17.7	20.4	24.3
South Side, - - -	27.4	24.5	44.7	41.1	34.4

From this exhibit it will be observed, that with the exception of the year 1875, when scarlet fever was unusually prevalent in the East End, the mortality from diseases of that class was to a very great extent confined to the locality referred to, and seems to be conclusive evidence that there is something radically wrong.

The efforts of this Board and its officers, under existing circumstances, can only mitigate to some extent the evils which contribute to this unsatisfactory condition of affairs.

The permanent remedy would seem to consist in at least a partial reconstruction of the sewerage system, its extension to a considerable extent, the systematic removal of ashes, garbage and other refuse, which plan should apply to the entire city, and such other changes and improvements as experience and research may suggest. These improvements would of course be attended with considerable outlay, which at this unfortunate period, when our city is burdened with excessive taxation, would no doubt be offered as a serious objection to the prosecution of the work, but when viewed in the proper light, that of good health versus disease and death, should not weigh against the absolute necessities of the hour.

SMALL-POX.

But three cases of this disease were reported during the year, distributed as follows: January, 1; February, 1; March, 1. This shows a remarkable decrease in the prevalence of the disease as compared with the four preceding years, during which time 2.660 cases occurred, distributed as follows: 1875, 158; 1876, 421; 1877, 1,370; 1878, 711. This gratifying decrease is to be attributed principally to the general vaccination which prevailed during 1878. That the present immunity will continue is not at all probable, when the facts are considered. About five thousand children are born annually in this city, and of this number it is safe to say fully one-third are never vaccinated. This, in a very few years, will have formed a nucleus from which an epidemic may be expected. These facts surely show the necessity for prompt action by which such a calamity may be averted. For this purpose a compulsory vaccination law is necessary. Several attempts have been made to have such a law enacted by the Legislature, but failed, I presume, owing to the fact that our Legislators did not fully understand the importance of such a measure. Such a provision already exists in the health laws of this city, but owing to its peculiar construction it is practically useless. Such a law to be effective should be general in its provisions, so as to include the entire State, or better still, should be enacted by Congress, and include the entire country. Such an innovation as this, however, I fear, is not to be expected in the immediate future, and is not likely to be accomplished, until the disease sweeps over our State or country leaving desolation in its wake, when our law-makers may be brought to a realizing sense of their duty to the public in this respect. Although, as usual, a tender of gratuitous vaccination at this office daily was given, yet only 93 persons availed themselves of it during the past year. If this be an index of the extent to which the operation was performed, as it has been in former years, it would appear that but little effort is being made upon the part of the public to avert the epidemic, which is sure to come, unless measures are taken to prevent it.

DIPHTHERIA.

This disease, which prevailed so extensively in our city during the past three years, still continued with but little abatement during 1879. As usual, comparatively few cases occurred during the spring and summer, but with the approach of autumn it increased until it again assumed epidemic proportions. As heretofore, it first made its appearance in the most virulent form upon the South Side and in the locality of the badly constructed sewers and sewer connections, and eventually spread to other portions of the city. The following statements exhibit the distribution of the cases reported to this office by months and wards during the year:

The following Statement shows the number of cases of Diphtheria reported to this office during each month of the year 1879:

January,	50
February,	10
March,	18
April,	23
May,	26
June,	34
July,	25
August,	67
September,	109
October,	116
November,	103
December,	98
Total,	679

The following Statement shows the number of cases of Diphtheria reported to this office from each ward during the year:

First,	13
Second,	2
Third,	7
Fourth,	9
Fifth,	8
Sixth,	11
Seventh,	5
Eighth,	5
Ninth,	13
Tenth,	4
Eleventh,	6
Twelfth,	28
Thirteenth,	12
Fourteenth,	13
Fifteenth,	37
Sixteenth,	30
Seventeenth,	33
Eighteenth,	6
Nineteenth,	6
Twentieth,	14
Twenty-first,	14
Twenty-second,	7
Twenty-third,	8
Twenty-fourth,	59
Twenty-fifth,	73
Twenty-sixth,	86
Twenty-seventh,	53

Twenty-eighth,	54
Twenty-ninth,	31
Thirtieth,	7
Thirty-first,	2
Thirty-second,	8
Thirty-third,	1
Thirty-fourth,	2
Thirty-fifth,	5
Thirty-sixth,	7
Total,	679

While but 679 cases of the disease were reported, yet the mortality from that source amounted to 354, from which it would appear that the ratio of mortality was exceedingly large, and the disease unusually fatal. The true state of the case, however, is, that but few of our physicians take the trouble to perform the important duty of reporting cases under their care; for what reason I am at a loss to know, and the law relating to the subject being very vague and inoperative, we are at a loss to know how to compel its observance. Until the law is properly amended, or the physicians come to realize the responsibility resting upon them by reason of failure to make such reports, this department will of necessity lack much valuable information, which can only be obtained from that source.

SLAUGHTER HOUSES.

Slaughter-houses, as heretofore, continue to be great sources of annoyance to persons residing in their vicinity, and of complaint to this office. Frequent inspections, and the institution of legal proceedings have only had the effect of mitigating to some extent the nuisance arising from them. Of the one hundred and fifty or more located within the city limits, but very few can be classed as anything but nuisances. Being, as a rule, constructed upon the most economical plans and in the worst localities, it is almost impossible that they should be other than nuisances of the worst character.

In order to remedy this evil, but two plans suggest themselves: First, to drive them out of the city; second, to concentrate the business under the "abbatoir" system, in the city where they can yet be under the control of the health department, and thus the nuisance which must always necessarily arise from the prosecution of this business be reduced to a minimum. The "abbatoir" system has been adopted and maintained in many of the cities of Europe as well as this country. Their experience in the adoption of this system is that it is the only one yet proposed which combines all the elements that go to insure immunity from the evils inseparably connected with the old system. The essentials and advantages of the "abbatoir" are thus set forth by the State Board of Health of Massachusetts in their third annual report:

> "*First*—A pavement of stone, or some material impervious to blood; *second*, an abundant supply of water; *third*, complete drainage; *fourth*, vats for the rendering of fat and offal, on the spot, before putrifaction can attack them; *fifth*, the means of converting blood into blood-albumen.
>
> The *Sanitary* advantages of such a system would be, *first*, the removal of the present offensive odors; *second*, the removal of slaughter-house pork from the markets; *third*, the ready inspection of meat, thus insuring the rejection of that which is unfit for food.
>
> The *Economical* advantages would be, *first*, diminished liability of having meat spoiled by exposure to the emanations from putrid pig pens; *second*, the value of the blood, which would be saved and utilized; *third*, the saving which must always accompany order, system, the division of labor, the avoidance of transportation, and the doing of any business on a large scale; *fourth*, the greatly increased value of property in the vicinity of the present slaughter-houses."

That these advantages are such as should commend themselves to this community, there can be no doubt; and as a change in the mode of conducting the business of slaughtering should be made very soon, the foregoing plan, the advantages of which could be elaborated upon to a much greater extent than the limits of this report will permit, is therefore respectfully submitted to those whose duty, as legislators, it is to promote the welfare and health of the people of this great city.

SANITARY INSPECTION.

Sanitary inspection, both prompt and thorough, is one of the most important duties imposed upon health authorities. It is a trite and truthful saying, that "what is everybody's business, is nobody's." This is especially true in reference to the subject referred to. It is, therefore, necessary to make it the duty of some person or persons to look after what I deem the most important branch of the health service. The system in vogue in this city for a number of years—that of the employment of a corps of Sanitary Inspectors for the performance of that duty, was adhered to during the year, and was regarded as being the best method which presented itself to this Board and proved to be comparatively successful.

The work performed by these inspectors during the year is exhibited in the following statement, which compares favorably with that of former years:

STATEMENT

Showing the Number and Character of the Nuisances visited and abated during the year 1879, *upon notice from this office.*

DESCRIPTION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Alleys, filthy	15	12	29	50	46	53	32	39	33	24	23	24	380
Courts, "	...	1	1	2	4	7	9	4	9	6	2	2	47
Cellars, "	3	7	4	10	14	21	23	20	21	15	10	16	164
Defective drainage	2	...	3	10	15	8	11	9	1	13	6	6	84
Drain pipes, leaking	...	...	3	5	2	1	4	5	3	7	...	...	30
Gutters, filthy	...	9	13	21	26	35	24	28	43	37	32	15	283
Gutters, obstructed	9	4	...	3	18	10	8	19	7	13	14	4	109
Garbage, thrown on streets	39	33	25	44	58	95	43	68	65	49	41	30	590
Garbage, thrown on vacant lots	9	10	25	29	64	46	51	43	42	28	21	20	478
Houses, filthy	1	...	1	...	1	6	7	4	5	4	1	1	31
Houses, disinfected	2	1	1	...	...	...	...	...	...	...	...	...	4
Houses, damp	...	...	3	2	...	3	...	4	1	2	2	1	18
Hog-pens, filthy	1	1	3	8	8	11	6	10	16	10	12	3	89
Infected bedding, &c., destroyed.	2	1	1	...	...	...	...	...	...	...	...	...	4
Manure heaps, removed	4	5	16	12	13	25	15	18	13	27	17	8	173
Manure boxes, on street	...	...	5	2	6	6	7	7	4	8	5	7	57
Offal removed	...	1	1	2	6	...	6	2	2	3	2	...	25
Ponds of water	...	...	6	8	6	5	13	16	7	5	4	6	76
Privies, dangerous	...	1	1	2	4	1	3	4	4	2	...	1	23
" filthy	4	4	7	7	16	20	11	18	12	12	12	11	134
Privy-wells, full	29	22	70	120	225	154	176	164	94	116	72	45	1287
" leaking	5	...	6	26	26	21	20	20	15	10	15	12	176
" foul	...	...	3	6	21	26	33	23	22	14	9	7	164
Roofs, leaking	2	...	1	...	1	1	...	1	1	...	...	2	9
Streets, filthy	...	...	6	5	10	8	13	8	8	8	5	5	76
Slaughter-houses, filthy	1	...	2	2	6	9	10	11	8	15	7	4	75
Stables, filthy	3	3	5	12	11	19	19	15	16	26	12	10	151
Sewers, obstructed	8	1	3	13	18	9	16	14	7	24	7	19	139
Vacant lots, filthy	...	6	5	8	3	15	12	6	11	8	4	1	79
Water in cellars	6	7	25	30	13	15	26	23	11	11	11	8	186
Water-closets, foul	...	1	...	...	2	1	6	1	1	5	1	1	19
" leaking	2	1	..	1	...	1	1	...	7	4	2	1	20
Water courses, filthy	...	...	2	...	9	8	5	5	9	13	4	5	60
" obstructed	5	4	2	3	7	10	12	12	7	13	9	12	95
Yards, filthy	9	10	3	66	59	88	72	57	53	52	41	38	548
Miscellaneous, (verbal notices,)	14	13	13	23	32	29	25	35	10	36	30	17	277
Total	175	158	332	533	751	767	718	713	568	622	435	342	6114
Dead animals removed	65	39	93	108	137	113	218	711	228	94	85	87	1978
Cases of Small-pox Visited	1	1	1	...	...	...	...	...	...	...	...	...	3

In the accomplishment of such an immense amount of work, as is represented in the foregoing statement, it must not be supposed that all of the notices were complied with without opposition on the part of offenders; but I am glad to be able to state that in only sixteen cases did it become necessary to use harsh measures by invoking the aid of the law.

That the duties of the Inspectors are easy, or that the positions are sinecures, if the duties are properly performed, is one of the fallacies which the uninitiated are very liable to entertain. Thrown in contact with all classes of society, from the millionaire to the pauper, the gentleman and the ruffian, treated with contempt in many cases by the former, and with positive insult by the latter, and at times burdened with a multiplicity of duties, is it to be wondered at that they sometimes fail to accomplish the desired result? Scarcely any one enjoys being informed that he is guilty of maintaining a nuisance, and in many instances the recipient of such information is made a life-long enemy. One person will find fault with the officer for performing his duty, while another will curse him for failing to do it.

The public is a hard taskmaster, and judges its servants not so much by what they do, however much, as by what they fail to do, not inquiring whether that failure is the result of neglect on their part, or of circumstances over which they have no control. Many of the nuisances complained of at this office require for their proper abatement, the grading and paving of streets and alleys, or the repair of the same; the construction of sewers and other improvements and changes which are of a public nature, and can only be accomplished by the circumlocution of the law as made and provided in such cases, and are therefore beyond the reach or jurisdiction of this Board. For these reasons the public should be lenient, and endeavor to fully understand the situation in each case before making wholesale denunciation of this department or its officers, for apparent failure to meet their demands. The Inspectors in the employ of this Board I believe are all conscientious, and endeavor to perform their duties to the best of their ability, and deserve the moral support of all lovers of sanitary reform.

STATEMENT

Showing the number of Cesspools emptied during the year 1879, *upon permits issued from this office.*

January,	33
February,	24
March,	73
April,	146
May,	248
June,	132
July,	156
August,	160
September,	94
October,	116
November,	64
December,	45
Total,	1,291

STATEMENT

Showing the receipts of the office during the fiscal year ending January 31st, 1880.

1879. MONTHS.	Received from Permits.	Received from Fines, &c.	Total Receipts.
February,	$ 12 00	......	$ 12 00
March,	36 50	......	36 50
April,	73 00	......	73 00
May,	124 00	......	124 00
June,	264 00	$ 5 00	269 00
July,	312 00	......	312 00
August,	320 00	24 00	344 00
September,	188 00	2 00	190 00
October,	58 00	....	58 00
November,	32 00	50 00	82 00
December,	22 50	35 00	57 50
January, (1880,)	19 50	......	19 50
Total,	$1,461 50	$116 00	$1,577 50

During the month of March, of the present year, and prior to the completion of this report, typhoid fever suddenly appeared in an epidemic form upon the South Side. The Board at once took action, and appointed a special committee to ascertain the cause of the outbreak. Said committee, some time after, presented an exhaustive report of their investigation, when, as it was desirable that said report should be placed in the hands of the public at once, and with as little expense as possible, it was determined to publish it in connection with this report, which is the principal cause of the delay in its publication. Said report will be found in the appendix, and deserves careful perusal.

Respectfully submitted.

CROSBY GRAY,
Health Officer.

FIRST SANITARY INSPECTION DISTRICT.

PITTSBURGH, *January*, 1880.

CROSBY GRAY, *Health Officer:*

SIR:—I herewith submit the following report of work performed in the First District during the past year:

The district includes portions of the Second, Third and Fifteenth, and all of the First, Fourth, Ninth, Tenth and Twelfth wards.

I have no new suggestions to offer which would be of any sanitary value.

The district contains many vacant lots. These lots are the receptacles of all the garbage of the surrounding neighborhood. I have made a special effort to stop this practice, and have succeeded in having the garbage removed from twenty, and compelled the owners in five cases to fence their lots in. In two cases, suit had to be entered before the owners would comply with my notice to abate the nuisance.

I have but little faith in the contract system of cleaning streets. When in the Commissioner's hands, a word to him was sufficient; but the contractor pays no attention to the Inspector, and his men shirk their duty at all times.

I have also paid particular attention to tenement houses, visiting some of them almost daily until I was able to get the tenants to pay some attention to sanitary regulations. They are now in much better condition than ever before.

During the year but one case of small-pox occurred in the district. The patient was promptly attended to, the premises thoroughly disinfected, and further spreading of the disease prevented.

The accompanying table shows the number and character of nuisances abated in the First District during the past year:

STATEMENT

Showing the number and character of the Nuisances visited and abated in the First District during the year 1879.

Alleys, filthy,	114
Courts, "	16
Cellars, "	53
Defective drainage,	11
Drain pipes, leaking,	18
Gutters, filthy,	87
Gutters, obstructed,	31
Garbage and filth thrown on streets,	39
Garbage and filth thrown on vacant lots,	12
Houses, filthy,	15
Houses, infected,	2
Houses, damp,	7
Hog pens, filthy,	5
Infected bedding, &c., destroyed,	3
Manure heaps,	61
Manure boxes on street,	8
Offal removed,	5
Ponds of water,	4
Privies, dangerous,	4
Privies, filthy,	40
Privy wells, full,	320
Privy wells, leaking,	28
Privy wells, foul,	80
Roofs, leaking,	5
Streets, filthy,	16
Slaughter houses, filthy,	2
Stables, filthy,	26
Sewers, obstructed,	62
Vacant lots, filthy,	20
Water in cellars,	41
Water closets, foul,	15
Water closets, leaking,	9
Water courses, filthy,	9
Water courses, obstructed,	16
Yards, filthy,	127
Miscellaneous,	79
Total,	1,390
Dead animals removed.	365
Cases of small-pox visited,	1

Respectfully submitted,

F. C. O'BRIEN,
Sanitary Inspector, First District.

SECOND SANITARY INSPECTION DISTRICT.

PITTSBURGH, *January*, 1880.

CROSBY GRAY, *Health Officer:*

SIR:—I herewith submit a report of the labor performed in the Second Sanitary District during the year 1879.

This district is composed of the Fifth, Sixth, Seventh, Eighth, Thirteenth, Fourteenth, Twenty-second, Twenty-third and parts of Second and Third wards, and represents all the characteristics of the city as regards natural and artificial drainage, manufacturing, merchandizing, architecture, &c.

In reviewing the business of the past year I find that the complaints emanating from citizens of this district were caused principally by leaking privies and accumulations of garbage on vacant property. Complaints from those residing in the vicinity of slaughter houses have not been so frequent, but, in some instances, very bitter and loud.

The former cause of complaint can only be effectually disposed of by the total abolition of the old privy wells, and substituting in their stead dry earth or ash closets, or the perhaps more expensive plan of properly trapped water closets connected with independent close sewers, laid for the purpose of carrying all such matter directly to our rivers, where nature may have an opportunity to perform her work of purification in her own way. By this means, our present sewers, which from necessity must have open drops at each street corner to receive surface drainage, would be relieved of this factor, which is an important one, in the generation of those noxious gases which in the past have proven so deleterious to life and health in our city.

The manner of disposing of garbage, in order to prevent its being thrown on vacant property and other places of deposit equally objectionable, has for years been a question, and one which up to the present time remains unanswered.

The next and not least of permanent nuisances are our slaughter houses as they exist, being scattered here and there over the entire city, often in localities where the absence of sewers and the scarcity of water render cleanliness impossible. Many of our butchers, however, having the means and facilities at hand, have spared neither pains nor money in order to bring their places up to the standard required by this Board. Nevertheless, with all that has been done and all that may be done in this way, the fact can not be concealed that slaughter houses, in the general acceptation of the term, are nuisances of so grave a character that we can not conscientiously overlook them. The only feasible plan by which the evil may be remedied seems to lie in the establishment of an abbatoir, and the removal of the entire business to that place.

But one case of small-pox, of a modified form, was reported from this district during the year. This is a significant fact; the more so when we consider the hundreds, who, in the past two years, have availed themselves of the liberality of this Board in securing free vaccination, and thereby receiving that immunity from small-pox which vaccination so surely gives.

The sanitary condition of the district, with the exception, perhaps, of a few streets, compares favorably with that of the preceding year. Many nuisances have been permanently abated, which, in past years, were sources of constant complaint.

STATEMENT

Showing the number and character of the Nuisances visited and abated in the Second District during the year 1879.

Alleys, filthy,	48
Courts, “	22
Cellars, “	45
Defective drainage,	40
Drain pipes, leaking,	11
Gutters, filthy,	41
Gutters, obstructed,	38
Garbage and filth thrown on streets,	46
Garbage and filth thrown on vacant lots,	76
Houses, filthy,	5
Houses, infected,	3
Houses, damp,	10
Hog pens, filthy,	5
Infected bedding, &c., destroyed,	3
Manure heaps,	6
Manure boxes on street,	2
Offal removed,	1
Ponds of water,	7
Privies, dangerous,	14
Privies, filthy,	71
Privy wells, full,	461
Privy wells, leaking,	109
Privy wells, foul,	42
Roofs, leaking,	3
Streets, filthy,	3
Slaughter houses, filthy,	4
Stables, filthy,	17
Sewers, obstructed,	46
Vacant lots, filthy,	13
Water in cellars,	46
Water closets, foul,	3
Water closets, leaking,	1
Water courses, filthy,	7
Water courses, obstructed,	15
Yards, filthy,	140
Miscellaneous,	141
Total,	1,545
Dead animals removed,	629
Cases of small-pox visited,	1

Respectfully submitted,

W. C. McCord,
Sanitary Inspector, Second District.

THIRD SANITARY INSPECTION DISTRICT.

PITTSBURGH, *January*, 1880.

CROSBY GRAY, *Health Officer:*

SIR:—In accordance with the requirements of the Board of Health, I have the honor, herewith to submit a report of my year's labor, in the Third District for the year 1879.

My district comprises portions of the Thirteenth, Fourteenth and Fifteenth wards and all of the remaining wards of the city up to and inclusive of the Twenty-third ward. The boundary of said district being all of the city of Pittsburgh east of Soho street and Thirty-third street, lying between the rivers.

The sanitary condition of the district is fair, except that a number of dwellings are in a bad sanitary condition from the fact of having the water-closets in the house, from which there is no proper drainage or sewerage. In others, where the privy wells become full, they sink new wells and fill or cover up the old ones, and continue this practice until their lots are honey-combed with old vaults. I have no recommendations to make on these points, but desire to call your attention to the fact that such a condition of affairs breeds contagion, and particularly is it noticeable that in houses with water-closets typhoid fever and diphtheria are more generally fatal. Several instances have occurred in my district during the past year. The wooden pavements are fast decaying, particularly those on Penn and Collins avenues, and during warm weather there is a very foul stench arising from them. The Collins avenue pavement is too rotten to be repaired, and I would recommend that it be at once taken up and the clay road used until the property owners are able and willing to lay some more substantial and durable pavement than pine blocks. It is surprising that there has been so little sickness in the Nineteenth ward during the past year, as owing to the damp and marshy ground there are but few cellars in that ward that do not contain more or less water during the whole year, which in some instances so injures the buildings as to necessitate the tearing down and rebuilding of portions of them. I find also that a number of persons have laid private sewers from their dwellings, not to any particular point, but just far enough from their own premises to carry off the waste water, &c. Some complaints have been made to me on this account, but on investigation I found that I was powerless in the premises. A system of sewerage for the whole East End should be devised, and it could be so constructed that thecost would not be great. The table hereunto annexed will more fully and in detail show my labors during the past year.

STATEMENT

Showing the number and character of the Nuisances visited and abated in the Third District during the year 1879.

Alleys, filthy,	164
Courts, "	8
Cellars, "	15
Defective drainage,	7
Drain pipes, leaking.	1
Gutters, filthy,	50
Gutters, obstructed,	18
Garbage and filth thrown on streets,	122
Garbage and filth thrown on vacant lots,	118
Houses, filthy,	1
Houses, infected,	1
Hog pens, filthy,	45
Infected bedding, &c., destroyed,	1
Manure heaps,	50
Manure boxes on street,	33
Offal removed,	15
Ponds of water,	61
Privies, dangerous,	1
Privies, filthy,	5
Privy wells, full,	84
Privy wells, leaking,	4
Privy wells, foul,	3
Roofs, leaking,	1
Streets, filthy,	17
Slaughter houses, filthy,	32
Stables, filthy,	28
Sewers, obstructed,	16
Vacant lots, filthy,	25
Water in cellars,	53
Water closets, foul,	1
Water closets, leaking,	5
Water courses, filthy,	24
Water courses, obstructed,	4
Yards, filthy,	39
Miscellaneous,	7
Total,	1,060
Dead animals removed,	124

Respectfully submitted,

J. J. LAWSON,
Sanitary Inspector, Third District.

FOURTH SANITARY INSPECTION DISTRICT.

PITTSBURGH, *January*, 1880.

CROSBY GRAY, *Health Officer:*

SIR:—I have the honor to submit the following brief report of the work performed in the Fourth Sanitary District during the year ending December 31st, 1879:

The boundaries of the district are as follows, viz: On the north by the Monongahela river; on the east and south by the township of Lower St. Clair, and Thirty-first ward; on the west by the Thirtieth ward to Manor street; thence by Manor street to the eastern line of the Twenty-eighth ward, to the Monongahela river; and embraces the Twenty-fourth, Twenty-fifth, Twenty-sixth and Twenty-seventh wards. In presenting this report, I would say that I feel encouraged, from the fact of there having been much improvement in the sanitary condition of the district, many nuisances, which had for years existed and become what are termed "chronic," have been permanently abated, in which case it has proven a matter of congratulation and of benefit to those who were forced by circumstances to suffer from their influences. Vacant lots, as in former years, still form a conspicuous part of the duties devolving upon the Sanitary Inspector, from the fact of their being made the receptacle of ashes, garbage, and in fact all manner of refuse and filth. The only remedy at present is to notify the owners to have them cleaned, which is no sooner done than in a short time they become as great nuisances as before. Until some practical system of scavenging is established throughout the city, they will continue to be (as in the past) the source from which much of the contagion in their locality emanates. I was successful in having the owners of several of the smaller vacant lots fence them as the only relief from a yearly expense of cleaning them. The paved streets and alleys are in good condition, with but two exceptions, Sarah and Jane streets, where the wooden block pavement has been laid. These streets are at present in the same filthy condition that Wood, Diamond and other streets of their class (in the Old City) were previous to their having been repaved. At present there is but slight hope of their being remedied other than by occasional repairing. The gutters are in a much better condition than for several years past, many of the badly-constructed, carelessly-graded and worn-out gutters, which, together with misplaced curb-stones, were the cause of serious nuisances, have been regraded and repaved. The gutters on those streets and alleys that are neither graded nor paved were but irregular courses and in a filthy condition. A majority of these, I am happy to say, have been improved by box-drains. In regard to sewerage, I deem it unnecessary to add anything farther to that already spoken of by my predecessors, for there has been as yet no improvement in the matter of much needed sewerage. During the present year, a petition, signed by the property holders of the upper portion of Twenty-fifth street, was presented to Councils, asking that a sewer be constructed on that street, which petition was referred to the Street Committee, which visited the locality in a body, and, after examination, came to the conclusion that a sewer would be of more benefit on Twenty-fourth street, but as yet the matter has received no final consideration. There are quite a number of slaughter houses in this district, some of which require, during the warm season, daily inspections, from the fact of the careless and unsystematic manner of conducting the business. Their sanitary condition in general, however, has been good, as there have been but few complaints concerning them during the year. A large pond of water, situated on Twenty-fourth and Josephine streets, which, in the winter season, was made use of by parties engaged in the ale and beer brewing business as a means for obtaining ice, became, in the Summer months, so foul and stagnant that it was necessary to notify the owners to have it filled to the grade of the several streets surrounding it, as it was a cause of general complaint from the citizens of that locality. I am pleased to say that it is now a thing of the past.

STATEMENT

Showing the number and character of the Nuisances visited and abated in the Fourth District during the year 1879.

Alleys, filthy,	41
Courts, “	1
Cellars, “	19
Defective drainage,	16
Gutters, filthy,	51
Gutters, obstructed,	14
Garbage and filth thrown on streets,	226
Garbage and filth thrown on vacant lots,	122
Houses, filthy,	4
Houses, damp,	1
Hog-pens, filthy,	7
Manure heaps,	44
Manure boxes on street,	11
Offal removed,	3
Ponds of water,	2
Privies, dangerous,	1
Privies, filthy,	6
Privy wells, full,	160
Privy wells, leaking,	15
Privy wells, foul,	5
Streets, filthy,	2
Slaughter houses, filthy,	11
Stables, filthy,	35
Sewers, obstructed,	11
Vacant lots, filthy,	9
Water in cellars,	24
Water closets, leaking,	2
Water courses, filthy,	11
Water courses, obstructed,	10
Yards, filthy,	197
Miscellaneous,	59
Total,	1,120
Dead animals removed,	411

Respectfully submitted,

GEORGE W. BRACEY,
Sanitary Inspector, Fourth District.

FIFTH SANITARY INSPECTION DISTRICT.

PITTSBURGH, *January*, 1880.

CROSBY GRAY, *Health Officer* :

SIR:—In making a report of my last year's labors as Sanitary Inspector of the Fifth District, I have but little to add to the experience of the previous year, but would respectfully repeat the suggestions made in former reports. The Fifth District is composed of nine wards, lying south of the Monongahela river, commencing at 17th street, includes the 28th, 29th, 30th, 31st, 32d, 33d, 34th, 35th and 36th wards. During the summer months there was considerable complaint from the residents of the 28th and 29th wards, where there are many slaughter houses, which on account of their location, and because of the irregular and unsystematic method of conducting their business, have become permanent nuisances. Last year it required constant watching to induce them to remove their offal before it became a nuisance. The surface drainage is also a frequent cause of complaint. Some improvement has been made in sewerage: a private sewer has been made on 14th street, from Carson to Washington streets, which is of great benefit to the residents of that locality. There are numerous places throughout the district where there are vacant, unimproved lots; parties take advantage of night to throw ashes, garbage, and all kinds of refuse thereon. There are many unpaved streets in the district, which cause much complaint from defective drainage. There has been some improvements on some of the streets by putting in box drains to carry off the surface water.

STATEMENT

Showing the number and character of the Nuisances visited and abated in the Fifth District during the year 1879.

Alleys, filthy,	14
Courts, “	1
Cellars, “	32
Defective drainage,	11
Gutters, filthy,	56
Gutters, obstructed,	15
Garbage and filth thrown on streets,	167
Garbage and filth thrown on vacant lots,	59
Houses, filthy,	6
Houses, infected,	1
Hog pens, filthy,	28
Infected bedding, &c., destroyed,	1
Manure heaps,	15
Manure boxes on street,	1
Offal removed,	1
Ponds of water,	2
Privies, dangerous,	3
Privies, filthy,	12
Privy wells, full,	263
Privy wells, leaking,	19
Privy wells, foul,	34
Streets, filthy,	37
Slaughter houses, filthy,	26
Stables, filthy,	47
Sewers, obstructed,	4
Vacant lots, filthy,	6
Water in cellars,	34
Water closets, leaking,	3
Water courses, filthy,	7
Water courses, obstructed,	53
Yards, filthy,	88
Miscellaneous,	4
Total,	1,050
Dead animals removed,	449
Cases of small-pox visited,	1

Respectfully submitted.

CHARLES HAVIS,
Sanitary Inspector Fifth District.

REPORT OF REGISTRAR

OF

VITAL STATISTICS.

OFFICE OF THE BOARD OF HEALTH,
PITTSBURGH, *January*, 1880.

To the Board of Health:

GENTLEMEN:—I have the honor to present the following report upon the Vital Statistics of the City of Pittsburgh, for the year ending December 31, 1879.

The annexed statement exhibits the number of births, marriages, and deaths for the past seven years:

YEARS.	Births.	Marriages.	Deaths.
1873,	5,175	1,782	3,519
1874,	5,084	1,533	3,381
1875,	4,930	1,192	2,957
1876,	4,264	1,118	2,896
1877,	4,215	1,110	3,408
1878,	4,179	1,174	3,068
1879,	4,449	1,290	2,923

Seventy-three certificates of death were furnished by the Registrar during the year. These certificates relate to persons who died without a physician in attendance during their last illness, under circumstances which rendered investigation by the Coroner unnecessary.

The Registrar desires to express his obligations to the officials of the U. S. Signal Service for meteorological reports.

FIRST OR WINTER QUARTER OF 1879.

Twelve weeks and six days, ending Monday, March 31.

During this period there were registered 1,179 births, 263 marriages, and 692 deaths.

METEOROLOGY.

The mean temperature of January was 26.7°. Highest temperature, 54°, on the 28th; lowest, —11.5°, on the 3d; range, 65.5°.

Rain or snow fell upon ten days, to the amount of 1.54 inches. Prevailing direction of wind, west. Mean reading of barometer, 30.12 inches; highest, 30.54 inches, on the 26th; lowest, 29.53 inches, on the 9th; range, 1.01 inches. The mean relative humidity was 71.9 per cent.

The mean temperature of February was 27.7°. Highest temperature, 54°, on the 25th; lowest, 4°, on the 15th; range, 50°. Rain or snow fell upon twenty days, to the amount of 1.74 inches. Prevailing direction of wind, northwest. Mean reading of barometer, 30.09 inches; highest, 30.68 inches, on the 28th; lowest, 29.45 inches, on the 11th; range, 1.23 inches. The mean relative humidity was 72.8 per cent.

The mean temperature of March was 40.8°. Highest temperature, 77°, on the 9th; lowest, 19°, on th 19th; range, 58°. Rain or snow fell upon nineteen days, to the amount of 2.99 inches. Prevailing direction of wind, northwest. Mean reading of barometer, 30.08 inches; highest, 30.54 inches, on the 3d; lowest, 29.55 inches, on the 30th; range, 0.99 inches. The mean relative humidity was 67.4 per cent.

The mean temperature of the quarter was 31.7°. Highest temperature, 77°, March 9th; lowest, —11.5°, January 3d; range, 88.5°. Mean reading of barometer, 30.10 inches; highest, 30.68 inches, February 28th; lowest, 29.45 inches, February 11th; range, 1.23 inches. Mean relative humidity, 70.7 per cent. Rain or snow fell upon forty-nine days, to the amount of 6.27 inches.

Comparative Mortality of Winter Quarter.

	January.	February.	March.	1879.	1878.	Average of five preceding years.
Small-pox	1	...	...	1	69	24
Measles	2	...	6	8	2	14
Scarlet fever	3	4	3	10	18	39
Diphtheria	28	18	13	59	89	13
Whooping cough	3	1	5	9	19	10
Typhoid fever	8	6	10	24	23	27
Cerebro-spinal fever	...	...	1	1	...	8
Erysipelas	...	...	...	...	2	5
Puerperal diseases	3	3	5	11	10	8
Diarrhœal diseases	2	1	2	5	4	18
Consumption	28	31	24	83	90	86
Pneumonia	29	32	26	87	45	80
Bronchitis and congestion of lungs	9	27	21	57	33	55
Croup	...	...	...	...	2	9
Persons 70 years of age and over	30	12	16	58	54	54
Children under 5 years of age	91	118	108	317	321	349
Total deaths from all causes	244	225	223	692	745	749

There were reported during this quarter. 3 cases of small-pox and varioloid, 20 cases of scarlet fever, 37 cases of typhoid fever, and 78 cases of diphtheria.

SECOND OR SPRING QUARTER OF 1879.

Thirteen weeks, ending Monday, June 30.

During this period there were registered 934 births, 320 marriages, and 606 deaths.

METEOROLOGY.

The mean temperature of April was 48.5°. Highest temperature, 82°, on the 27th; lowest, 23°, on the 3d and 4th; range, 59°. Rain or snow fell upon fifteen days, to the amount of 1.63 inches. Prevailing direction of wind, northwest. Mean reading of barometer, 29.96 inches; highest, 30.51 inches, on the 22d; lowest, 29.33 inches, on the 10th; range, 1.18 inches. The mean relative humidity was 62.4 per cent.

The mean temperature of May was 63.9°. Highest temperature, 93°, on the 30th; lowest, 33°, on the 2d; range, 60°. Rain fell upon eleven days, to the amount of 1.20 inches. Prevailing direction of wind, northwest. Mean reading of barometer, 30.03 inches; highest, 30.45 inches, on the 9th; lowest, 29.63 inches, on the 4th; range, 0.82 inches. The mean relative humidity was 55.9 per cent.

The mean temperature of June was 69.5°. Highest temperature, 94°, on the 25th; lowest, 39°, on 7th; range, 55°. Rain fell upon fifteen days, to the amount of 4.56 inches. Prevailing direction of wind, southwest. Mean reading of barometer, 29.97 inches; highest, 30.29 inches, on the 19th; lowest, 29.43 inches, on the 15th; range, 0.86 inches. The mean relative humidity was 63.8 per cent. Frosts occurred on the 7th and 8th.

The mean temperature of the quarter was 60.6°. Highest temperature, 94°, June 25th; lowest, 23°, April 3d; range, 71°. Mean reading of barometer, 29.99 inches; highest, 30.51 inches, April 22d; lowest, 29.33 inches, April 10th; range, 1.18 inches. Mean relative humidity, 60.7 per cent. Rain or snow fell upon forty-one days, to the amount of 7.39 inches.

Comparative Mortality of Spring Quarter.

	April.	May.	June.	1879.	1878.	Average of five preceding years.
Small-pox	...	...	...	...	32	17
Measles	12	9	10	31	2	14
Scarlet fever	1	4	7	12	30	42
Diphtheria	15	16	16	47	36	9
Whooping-cough	4	2	7	13	16	20
Typhoid fever	4	3	1	8	26	25
Cerebro-spinal fever	...	...	...	...	2	15
Erysipelas	...	...	1	1	1	4
Puerperal diseases	2	1	5	8	12	11
Diarrhœal diseases	1	2	40	43	29	44
Consumption	21	20	22	63	93	95
Pneumonia	13	16	9	38	46	52
Bronchitis and congestion of lungs	16	5	4	25	16	35
Croup	..	...	1	1	6	3
Persons 70 years of age and over.	13	5	14	32	46	43
Children under 5 years of age	92	70	129	291	323	337
Total deaths from all causes	197	187	222	606	674	730

There were reported during this quarter, 25 cases of scarlet fever, 18 cases of typhoid fever, and 83 cases of diphtheria.

THIRD OR SUMMER QUARTER OF 1879.

Thirteen weeks and one day, ending Tuesday, September 30.

During this period there were registered 1,216 births, 307 marriages, and 908 deaths.

Meteorology.

The mean temperature of July was 75.6°. Highest temperature, 99°, on the 16th; lowest, 56°, on the 1st; range, 43°. Rain fell upon fourteen days, to the amount of 7.78 inches. Prevailing direction of wind, southwest. Mean reading of barometer, 29.94 inches; highest, 30.25 inches, on the 1st; lowest, 29.63 inches, on the 11th; range, 0.62 inches. The mean relative humidity was 66.6 per cent.

The mean temperature of August was 71.2°. Highest temperature, 93°, on the 22d; lowest, 50°, on the 10th; range, 43°. Rain fell upon nine days, to the amount of 4.56 inches. Prevailing direction of wind, northwest. Mean reading of barometer, 29.95 inches; highest, 30.16 inches, on the 29th; lowest, 29.64 inches, on the 25th; range, 0.52 inches. The mean relative humidity was 70.8 per cent.

The mean temperature of September was 61.7°. Highest temperature, 90°, on the 1st; lowest, 35°, on the 25th; range, 55°. Rain fell upon nine days, to the amount of 1.01 inches. Prevailing direction of wind, northwest. Mean reading of barometer, 30.10 inches; highest, 30.40 inches, on the 11th; lowest, 29.58

inches, on the 3d; range, 0.82 inches. The mean relative humidity was 71.1 per cent.

The mean temperature of the quarter was 69.5°. Highest temperature, 99°, July 16th; lowest, 35°, September 25th; range, 64°. Mean reading of barometer, 30.00 inches; highest, 30.40 inches, September 11th; lowest, 29.58 inches, September 3d; range, 0.82 inches. Mean relative humidity, 69.5 per cent. Rain fell upon thirty-two days, to the amount of 13.35 inches.

Comparative Mortality of Summer Quarter.

	July.	August.	September.	1879.	1878.	Average of five preceding years.
Small-pox	...	...	...	...	6	17
Measles	9	6	...	15	...	8
Scarlet fever	14	8	13	35	31	42
Diphtheria	11	46	48	105	160	40
Whooping-cough	7	9	3	19	11	30
Typhoid fever	3	7	15	25	40	32
Cerebro-spinal fever	1	...	...	1	...	4
Erysipelas	1	1	...	2	1	3
Puerperal diseases	2	5	2	9	13	6
Diarrhœal diseases	131	63	14	208	179	272
Consumption	19	23	22	64	67	71
Pneumonia	7	10	10	27	17	22
Bronchitis and congestion of lungs	6	8	7	21	15	19
Croup	...	...	1	1	1	11
Persons 70 years of age and over	12	8	10	30	43	43
Children under five years of age	243	187	107	537	495	644
Total deaths from all causes	363	316	229	908	928	1038

There were reported during this quarter, 80 cases of scarlet fever, 48 cases of typhoid fever, and 201 cases of diphtheria.

FOURTH OR AUTUMNAL QUARTER OF 1879.

Thirteen weeks and one day, ending Wednesday, December 31.

During this period there were registered 1,120 births, 400 marriages, and 717 deaths.

METEOROLOGY.

The mean temperature of October was 60.7°. Highest temperature, 91°, on the 5th; lowest, 29°, on the 25th; range, 62°. Rain fell upon nine days, to the amount of 0.65 inches. Prevailing direction of wind, northwest. Mean reading of barometer, 30.14 inches; highest, 30.74 inches, on the 25th; lowest, 29.59 inches, on the 29th; range, 1.15 inches. The mean relative humidity was 68 per cent.

The mean temperature of November was 43.2°. Highest temperature, 76°, on the 11th and 14th ; lowest, 16°, on the 21st; range, 60°. Rain fell upon twenty days, to the amount of 3.36 inches. Prevailing direction of wind, southwest. Mean reading of barometer, 30.13 inches; highest, 30.62 inches, on the 30th ; lowest, 29.57 inches, on the 15th; range, 1.05 inches. The mean relative humidity was 69.7 per cent.

The mean temperature of December was 38.9°. Highest temperature, 61°, on the 5th; lowest, 5.5°, on the 26th; range, 55.5°. Rain or snow fell upon eighteen days, to the amount of 5 inches. Prevailing direction of wind, west. Mean reading of barometer, 30.12 inches; highest, 30.60 inches, on the 13th; lowest, 29.58 inches, on the 6th; range, 1.02 inches. The mean relative humidity was 76.3 per cent.

The mean temperature of the quarter was 47.6°. Highest temperature, 91°, October 5th; lowest, 5.5°, December 26th; range, 85.5°. Mean reading of barometer, 30.09 inches; highest, 30.74 inches, October 25th; lowest, 29.57 inches, November 15th; range, 1.17 inches. Mean relative humidity, 71.3 per cent. Rain or snow fell upon forty-seven days, to the amount of 9.01 inches.

Comparative Mortality of Autumnal Quarter.

	October.	November.	December.	1879.	1878.	Average of five preceding years.
Small-pox	...	...	...	...	6	24
Measles	...	...	...	...	...	5
Scarlet fever	15	13	10	38	15	43
Diphtheria	47	56	40	143	198	72
Whooping-cough	7	4	10	21	7	10
Typhoid fever	12	14	8	34	26	40
Cerebro-spinal fever	...	3	1	4	...	2
Erysipelas	1	1	2	4	2	4
Puerperal diseases	2	2	3	7	5	6
Diarrhœal diseases	11	11	4	26	14	28
Consumption	17	20	14	51	65	77
Pneumonia	9	6	21	36	36	48
Bronchitis and congestion of lungs	8	7	17	32	23	26
Croup	...	2	1	3	3	20
Persons 70 years of age and over	16	9	10	35	54	40
Children under five years of age	104	124	108	336	307	322
Total deaths from all causes	230	245	242	717	721	715

There were reported during the quarter, 58 cases of scarlet fever, 64 cases of typhoid fever, and 317 cases of diphtheria.

PRINCIPAL METEOROLOGICAL FEATURES OF THE YEAR.

The mean temperature of the year was 52.4°, being 0.1° lower than the average for the six preceding years. The highest temperature, 99°, occurred July 16th; the lowest—11.5°, (below zero), occurred January 3d; range, 110.5°. Rain or snow fell upon one hundred and seventy-five days, to the amount of 37.02 inches, against an average of 37.42 inches for the six preceding years. The greatest atmospheric pressure, 30.74 inches, occurred October 25th; the least, 29.33 inches, occurred April 10th; the mean being 30.05 inches. The mean annual humidity was 68.06 per cent.

Comparative Meteorological Statement.

	BAROMETER.				THERMOMETER.				WIND.			RAINFALL.	
Years.	Highest.	Lowest.	Range.	Mean.	Highest.	Lowest.	Range.	Mean.	Prevailing direction.	Highest velocity Miles per hour.	Total number of miles traveled.	Number of rainy days.	Total rainfall—inches.
1873	30.760	29.190	1.570	29.994	94°	—7°	101°	54.2°	N.W.	36	51,914	171	40.70
1874	30.792	29.112	1.679	30.039	100°	4°	96°	52.5°	N.W.	36	57,570	140	39.30
1875	30.686	29.254	1.432	30.005	95°	-12°	107°	49.5°	N.W.	36	53,388	167	34.05
1876	30.767	29.157	1.610	29.993	101°	— 6°	107°	51.9°	N.W.	40	59,085	210	37.01
1877	30.712	29.143	1.569	30.005	96°	4°	92°	53.5°	N.W.	30	50,929	146	34.72
1878	30.633	29.048	1.585	29.949	101°	—1°	102°	53.5°	N.W.	30	51,857	176	38.76
1879	30.739	29.327	1.412	30.052	99°	-11.5°	110.5°	52.4°	N.W.	31	52,347	175	37.02

CHART

Illustrating the Weekly Mortality, the Mortality of Infants and Children under the age of five years, the Weekly means of Temperature and Humidity, the Maximum and Minimum Temperatures, and amount of rainfall in the City of Pittsburgh, during the year 1879.

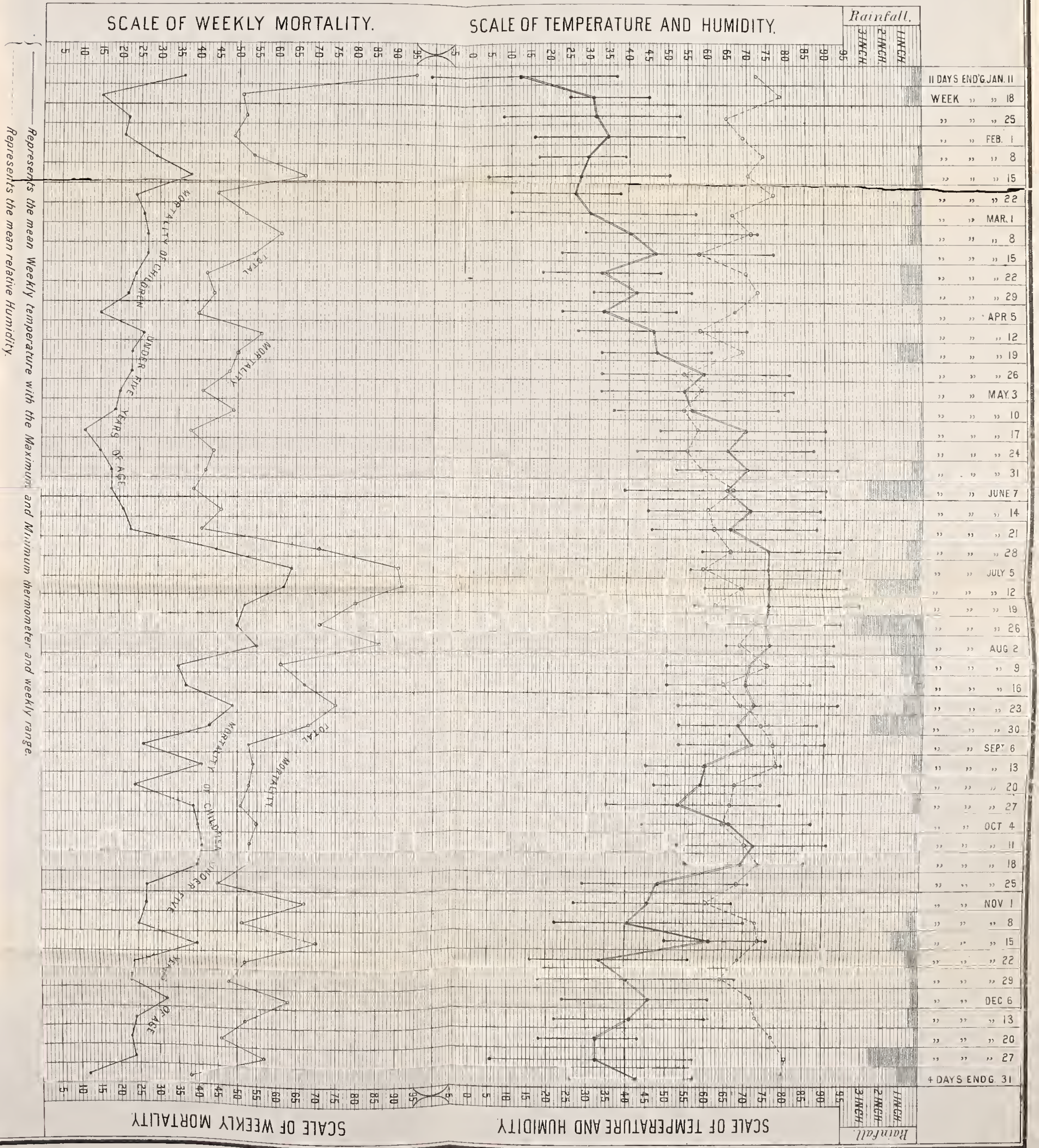


TABLE No. I.—CONSOLIDATED ABSTRACT OF DEATHS IN PITTSBURGH, FROM ALL CAUSES,

FOR THE YEAR ENDING DECEMBER 31, 1879.

CAUSES OF DEATH.	NATIVITY. UNITED STATES. White. M	F	Black. M	F	FOREIGN. M	F	AGE. Under one year.	1	2	5	10	20	30	40	50	60	70	80	90	Total by Sexes. M	F	Total, both sexes.	Percentage of each cause, on total.
General Diseases (A).																							
Measles,	26	26	...	1	...	1	9	23	16	5	1	..	...	...	...	...	...	...	....	26	28	54	1.85
Whooping cough,	27	32	1	2	...	...	23	22	16	1	...	...	...	...	...	..	...	....	...	28	34	62	2.12
Diphtheria,	180	165	2	..	2	5	19	55	139	113	19	6	3	...	...	...	...	....	...	184	170	354	12.11
Small pox,	...	1	...	...	...	...	1	...	..	...	...	...	...	...	...	...	...	...	...	...	1	1	0.04
Scarlet fever,	48	46	..	1	...	...	3	17	49	19	7	...	...	...	...	....	...	...	...	48	47	95	3.25
Typhoid fever,	31	31	4	1	11	13	...	1	4	11	20	30	13	6	4	2	...	...	...	46	45	91	3.11
Remittent fever,	2	1	...	...	...	...	...	1	...	1	...	1	...	...	...	...	...	...	....	2	1	3	0.10
Intermittent fever,	1	1	...	...	1	...	...	...	1	...	1	...	...	1	...	....	...	...	...	2	1	3	0.10
Cerebro-spinal fever,	3	3	...	...	...	...	1	...	2	2	...	1	...	...	....	....	...	...	...	3	3	6	0.21
Puerperal fever,	...	3	...	1	...	1	...	...	...	...	1	3	1	...	...	...	...	...	....	...	5	5	0.17
Erysipelas,	2	5	...	...	...	...	4	...	1	1	...	1	...	...	...	...	...	....	...	2	5	7	0 24
Pyæmia,	...	1	...	...	1	...	...	...	1	...	...	...	1	...	...	...	...	...	...	1	1	2	0.07
Simple cholera,	3	1	...	...	4	2	1	...	...	1	...	...	1	4	2	1	...	...	...	7	3	10	0.34
Choleraic diarrhœa,	30	38	...	...	...	...	8	57	3	...	...	...	...	...	.	.	...	...	...	30	38	68	2 33
Total,	353	354	7	6	19	22	69	176	232	154	49	42	19	11	6	3	...	...	...	379	382	761	26.04
General Diseases (B).																							
Phthisis pulmonalis,	52	57	2	6	57	41	...	...	...	1	13	71	58	34	21	12	4	1	...	111	104	215	7.35
Miliary tuberculosis,	8	14	1	...	9	6	...	...	...	...	8	13	7	3	2	4	1	...	...	18	20	38	1.30
Tabes mesenterica,	30	25	3	2	2	...	29	20	7	5	...	...	..	1	...	....	...	...	...	35	27	62	2.12
Tubercular meningitis,	7	5	2	...	...	...	6	5	...	2	1	...	...	...	...	...	...	...	...	9	5	14	0.48
Scrofula,	8	1	1	...	...	2	3	1	2	1	2	2	...	1	...	...	...	...	...	9	3	12	0.41

Consolidated Abstract of Deaths in Pittsburgh, etc.—Continued.

CAUSES OF DEATH.	NATIVITY.						AGE.													Total by sexes.		Total, both sexes.	Percentage of each cause, on total.
	UNITED STATES.				FOREIGN		Under one year.	1	2	5	10	20	30	40	50	60	70	80	90				
	White.		Black.																				
	M	F	M	F	M	F														M	F		
General Diseases (B.)—Continued.																							
Syphilis,	23	20	...	...	3	...	37	3	...	1	...	1	1	...	2	...	1	...	...	26	20	46	1.57
Rheumatism,	3	6	...	...	2	...	...	...	1	2	1	...	4	...	...	3	...	...	...	5	6	11	0.38
Dropsy, (cause not stated),	...	...	1	1	...	2	...	...	...	...	...	...	1	2	...	1	...	...	...	1	3	4	0.14
Cancer, (not stated),	1	1	...	...	...	3	...	...	...	...	...	...	...	1	...	4	...	...	...	1	4	5	0.17
" of face,	...	2	...	...	1	...	...	...	...	1	...	...	...	...	...	1	1	...	...	1	2	3	0.10
" œsophagus.	...	...	...	...	2	...	...	...	...	...	...	...	...	...	2	...	...	...	...	2	...	2	0.07
" breast,	...	2	...	...	...	1	...	...	...	...	...	...	1	...	1	1	...	...	...	...	3	3	0.10
" lungs,	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	1	0.04
" stomach,	1	...	...	...	7	4	...	...	...	...	...	...	...	3	2	5	1	1	...	8	4	12	0.41
" liver,	...	2	...	...	...	3	...	...	...	...	...	...	...	2	1	1	1	...	...	...	5	5	0.17
" uterus,	...	3	...	1	...	5	...	...	...	...	1	...	2	4	1	1	...	...	...	...	9	9	0.31
" bladder,	...	...	...	...	...	1	...	...	...	...	..	...	...	...	...	1	...	...	...	...	1	1	0.04
" rectum,	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	1	0.03
" penis,	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	1	0.04
" knee,	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	1	0.03
Total,	134	138	10	10	85	69	75	29	10	13	27	87	74	54	32	34	9	2	...	229	217	446	15.26
Diseases of the Nervous System.																							
Encephalitis,	3	4	...	...	...	...	2	1	2	...	...	1	...	...	...	1	...	...	...	3	4	7	0.24
Meningitis,	36	32	...	2	7	...	23	21	15	3	5	6	1	1	2	...	...	...	...	43	34	77	2.63
Congestion of brain,	13	12	...	1	2	...	10	5	7	3	...	2	1	...	...	...	...	...	...	15	13	28	0.96
Softening of brain,	...	...	1	...	1	...	..	...	...	...	...	...	...	1	...	...	1	...	...	2	...	2	0.07
Compression of brain.	1	1	...	...	...	...	1	...	...	...	...	1	...	...	...	...	...	...	...	1	1	2	0.07

Consolidated Abstract of Deaths in Pittsburgh, etc.—Continued.

CAUSES OF DEATH.	NATIVITY.						AGE.													Total, by Sexes.		Total, both sexes.	Percentage of each cause, on total.
	UNITED STATES.				FOREIGN		Under one year.	1	2	5	10	20	30	40	50	60	70	80	90				
	White.		Black.																				
	M	F	M	F	M	F														M	F		
Diseases of the Nervous System.—(Continued.)																							
Abscess of brain,	..	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	1	0.03
Apoplexy,	11	4	...	...	9	6	...	...	...	...	...	2	...	3	7	9	8	1	...	20	10	30	1.02
Paralysis,	4	3	...	...	7	5	...	...	...	...	1	...	...	1	3	10	2	1	1	11	8	19	0.65
Sclerosis,	1	1	...	...	...	.	...	...	...	...	...	...	...	1	1	...	...	...	...	1	1	2	0.07
Locomotor ataxy,	1	...	...	...	1	...	...	...	...	...	...	...	1	1	...	...	...	...	...	2	...	2	0.07
Hydrocephalus,	4	4	...	1	...	...	6	2	1	...	...	...	...	...	...	...	...	...	...	4	5	9	0.31
Epilepsy,	3	3	...	...	...	...	...	1	...	...	2	1	...	1	...	...	1	...	...	3	3	6	0.21
Tetanus,	4	1	...	...	...	...	3	...	...	...	1	1	...	...	...	...	...	...	...	4	1	5	0.17
Convulsions,	47	27	4	3	...	...	52	15	11	2	1	...	...	...	...	...	...	...	.	51	30	81	2.77
Insanity,	...	1	...	...	1	...	...	...	...	...	...	1	1	...	...	...	...	...	...	1	1	2	0.07
Abscess of spine,	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	1	0.03
Spina bifida,	1	2	..	...	...	...	3	..	...	...	...	...	...	...	...	...	...	...	...	1	2	3	0.10
Spinal disease, not stated,	1	1	...	...	...	...	...	.	...	...	1	1	...	...	...	...	...	...	...	1	1	2	0.07
Total,	130	97	5	7	29	11	100	45	37	8	11	16	5	9	13	20	12	2	1	164	115	279	9.54
Diseases of the Circulatory System.																							
Pericarditis,	3	2	...	...	3	3	...	...	...	...	...	1	1	2	3	2	2	...	...	6	5	11	0.38
Endocarditis,	...	...	...	...	2	...	...	...	...	...	...	...	1	1	...	...	...	...	...	2	...	2	0.07
Valve disease of heart,	9	12	...	...	3	6	...	...	...	3	6	3	4	3	3	5	3	...	...	12	18	30	1.03
Hypertrophy of heart,	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	1	0.03
Dilatation of heart,	2	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	2	...	2	0.07
Fatty degeneration of heart,	...	1	...	...	...	1	...	...	...	...	...	...	...	...	2	...	...	...	...	...	2	2	0.07

Consolidated Abstract of Deaths in Pittsburgh, etc.—Continued.

CAUSES OF DEATH.	NATIVITY.						AGE.													Total by sexes.		Total, both sexes.	Percentage of each cause, on total.
	UNITED STATES.				FOREIGN.		Under one year.	1	2	5	10	20	30	40	50	60	70	80	90				
	White.		Black.																				
	M	F	M	F	M	F														M	F		
Diseases of the Circulatory System.—Continued.																							
Malformation of heart,	3	2	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	3	2	5	0.17
Heart clot,	1	1	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	1	1	2	0.07
Aneurism (thoracic),	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	1	0.03
Angina pectoris,	2	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	2	...	2	0.07
Cyanosis,	8	9	...	..	...	...	17	...	...	...	...	...	...	...	...	...	...	...	...	8	9	17	0.58
Heart disease, not stated,	10	7	2	...	11	9	1	...	...	...	5	5	4	4	11	4	3	2	...	23	16	39	1.33
Total,	40	34	2	...	19	19	23	...	...	3	12	12	11	10	21	12	8	2	...	61	53	114	3.90
Diseases of the Respiratory System.																							
Asthma,	1	1	...	...	9	4	...	...	...	...	...	...	...	5	1	7	2	...	...	10	5	15	0.51
Croup,	2	3	...	...	...	...	1	1	2	1	...	...	...	...	...	...	...	...	...	2	3	5	0.17
Laryngitis,	2	3	...	...	1	...	3	...	1	...	1	...	...	...	...	...	1	...	...	3	3	6	0.21
Bronchitis,	12	13	...	...	8	5	8	9	4	...	1	...	2	2	1	9	2	...	...	20	18	38	1.30
Bronchial catarrh,	31	27	2	1	3	2	38	13	7	2	...	...	...	1	...	3	2	...	...	36	30	66	2.26
Congestion of lungs,	14	12	...	1	1	3	12	6	4	2	...	1	...	1	1	2	2	...	...	15	16	31	1.06
Pneumonia,	61	58	3	5	34	27	40	25	22	10	6	12	12	15	16	20	9	1	...	98	90	188	6.43
Pleurisy,	1	1	...	...	1	...	1	...	...	...	...	...	1	...	...	1	...	...	...	2	1	3	0.10
Hydrothorax,	2	...	...	...	1	...	...	...	..	...	1	.	...	1	1	...	...	...	...	3	...	3	0.10
Emphysema,	...	1	...	...	1	..	...	...	...	...	...	...	...	1	1	...	...	...	...	1	1	2	0.07
Pneumonic phthisis,	1	4	...	...	2	1	...	...	...	...	...	5	1	1	...	1	...	...	...	3	5	8	0 27
Atelectasis,	4	5	...	...	...	...	9	...	...	...	...	...	...	...	...	...	...	...	...	4	5	9	0.31
Total,	131	128	5	7	61	42	112	54	40	15	9	18	16	27	21	43	18	1	...	197	177	374	12.79

Consolidated Abstract of Deaths in Pittsburgh, etc.—Continued.

CAUSES OF DEATH.	NATIVITY.						AGE.													Total by sexes		Total, both sexes.	Percentage of each cause, on total.
	UNITED STATES.				FOREIGN.		Under one year.	1	2	5	10	20	30	40	50	60	70	80	90				
	White.		Black.																				
	M	F	M	F	M	F														M	F		
Diseases of the Digestive System.																							
Teething,	13	19	...	...	...	...	19	13	...	...	...	...	...	...	...	...	...	...	...	13	19	32	1.10
Stomatitis,	1	...	...	...	...	..	1	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	0.03
Gastritis,	4	9	1	...	3	7	3	...	4	1	1	1	3	4	1	5	1	...	...	8	16	24	0.82
Enteritis,	15	14	2	2	7	6	19	6	2	...	...	4	5	4	3	1	2	...	...	24	22	46	1.57
Typhlitis,	1	...	...	...	1	...	...	...	...	...	1	1	...	...	...	...	...	...	...	2	...	2	0 07
Peritonitis,	7	3	2	2	7	4	1	...	...	3	6	3	5	1	2	2	1	1	...	16	9	25	0.86
Obstruction of intestines,	1	1	...	..	1	...	...	...	.	...	1	1	1	...	...	...	...	...	...	2	1	3	0.10
Hemorrhage of intestines,	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	1	0.03
Ulceration of intestines,	...	...	..	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	1	0.03
Intussusception of intestines,	2	...	...	...	...	...	2	...	...	..	...	...	...	...	...	...	...	...	...	2	...	2	0.07
Hernia,	1	..	1	...	2	1	...	...	...	...	...	...	...	...	1	2	2	...	...	4	1	5	0.17
Diarrhœa,	88	88	2	1	1	2	166	10	2	...	...	...	1	1	1	1	...	...	..	91	91	182	6.23
Dysentery,	7	12	...	...	2	4	8	4	2	...	...	1	3	2	3	2	...	...	...	9	16	25	0.86
Abscess of liver,	...	...	...	...	2	...	...	...	...	.	...	...	...	1	...	1	...	...	...	2	...	2	0.07
Cirrhosis of liver,	3	1	...	...	9	3	...	...	...	...	...	1	3	3	5	4	...	...	...	12	4	16	0.55
Fatty liver,	1	...	...	...	2	...	...	...	...	...	...	1	...	...	1	1	...	...	...	3	...	3	0.10
Jaundice,	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	2	...	...	...	1	1	2	0.07
Hepatitis,	2	3	1	...	3	4	...	...	...	...	...	...	2	2	5	3	1	..	...	6	7	13	0.45
Obstruction of hepatic ducts,	...	1	..	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	..	...	1	1	0.03
Disease of liver, not stated,	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	...	1	0.03
Abscess of spleen,	1	...	...	...	...	...	...	...	...	...	...	1	...	..	...	...	...	...	...	1	..	1	0.04
Hypertrophy of spleen,	1	...	. .	...		...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	1	0.03
Imperforate anus,	...	1	...	...	...	...	1	...	..	...	...	...	...	...	...	...	...	...	...	...	1	1	0.03
Abdominal tumor,	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	2	...	...	...	2	...	2	0.07
Total,	149	152	9	5	45	32	220	33	11	4	10	15	23	19	22	27	7	1	...	203	189	392	13.41

Consolidated Abstract of Deaths in Pittsburgh, etc.—Continued.

CAUSES OF DEATH.	NATIVITY.						AGE.													Total by sexes		Total, both sexes.	Percentage of each cause, on total.
	UNITED STATES.				FOREIGN.		Under one year.	1	2	5	10	20	30	40	50	60	70	80	90				
	White.		Black.																				
	M	F	M	F	M	F														M	F		
Diseases of the Urinary System.																							
Bright's disease,	2	7	1	...	7	7	...	...	...	...	1	2	5	1	10	3	2	...	...	10	14	24	0.82
Nephritis,	3	...	1	...	1	...	...	...	1	...	1	...	...	1	1	...	1	...	...	5	...	5	0.17
Malformation of kidneys,	1	...	...	...	...	...	1	...	...	...	...	...	..	...	...	...	...	...	...	1	...	1	0.03
Diabetes,	2	...	...	...	2	...	...	...	...	...	...	1	1	...	1	1	...	...	...	4	...	4	0.14
Cystitis,	2	...	...	...	4	...	...	...	...	...	...	1	...	2	1	2	...	...	...	6	...	6	0.21
Stricture of urethra,	1	...	...	...	...	..	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	1	0.03
Total,	11	7	2	...	14	7	1	...	1	...	2	4	7	4	13	6	3	...	...	27	14	41	1.40
Diseases of the Generative System.																							
Metritis,	...	5	...	..	...	2	...	...	...	..	1	3	3	...	...	...	...	...	...	...	7	7	0.24
Metro-peritonitis,	...	1	...	...	...	5	...	...	...	...	...	2	4	...	...	...	...	...	...	...	6	6	0.21
Puerperal convulsions,	...	1	...	...	...	1	...	...	...	...	...	2	...	...	...	...	...	...	...	...	2	2	0.07
Puerperal septicæmia,	...	1	...	...	.	1	...	...	...	...	...	...	2	...	...	...	...	...	...	...	2	2	0.07
Uterine phlebitis,	...	1	...	...	...	...	...	...	...	.	...	...	1	...	...	...	...	...	..	...	1	1	0.03
Placenta prævia,	...	1	...	...	...	1	...	...	...	...	...	...	2	...	...	...	...	...	...	...	2	2	0.07
Post-partem hemorrhage,	...	3	...	...	...	...	...	...	...	...	...	2	1	.	...	...	...	...	...	...	3	3	0.10
Inversion of uterus,	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	1	0.03
Abortion,	...	2	..	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	2	2	0 07
Parturition,	...	1	...	...	...	3	...	...	...	...	...	...	3	1	...	...	...	...	...	...	4	4	0.14
Tumor of ovary,	...	...	...	...	...	2	...	...	...	...	...	...	...	1	1	...	...	...	...	...	2	2	0.07
Total,	...	17	...	...	...	15	...	...	...	...	2	10	17	2	1	...	...	...	..	...	32	32	0.10
Diseases and Conditions Unclassified.																							
Premature birth,	23	27	1	...	...	...	51	...	..	...	...	...	...	...	...	...	...	...	...	24	27	51	1.75
Old age,	10	14	2	4	26	29	...	...	...	...	...	...	...	...	...	4	34	39	8	38	47	85	2.91
Debility,	...	2	...	...	...	1	...	...	...	...	...	...	1	...	2	...	...	...	...	...	3	3	0.10

Consolidated Abstract of Deaths in Pittsburgh, etc.—Continued.

CAUSES OF DEATH.	NATIVITY.						AGE.													Total by Sexes.		Total, both sexes.	Percentage of each cause, on total.
	UNITED STATES.				FOREIGN.		Under one year.	1	2	5	10	20	30	40	50	60	70	80	90				
	White.		Black.																				
	M	F	M	F	M	F														M	F		
Diseases and Conditions Unclassified.—Continued.																							
Psoas abscess,	1	1	...	...	2	...	...	...	...	...	1	..	1	...	1	1	...	...	....	3	1	4	0.14
Abscess of thigh,	...	1	...	...	1	...	1	...	...	...	...	...	...	...	1	...	...	....	...	1	1	2	0.07
Abscess, not stated,	1	...	...	...	1	1	1	..	...	...	...	...	...	1	1	..	...	....	...	2	1	3	0.10
Caries of nose,	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	1	0.03
Caries of vertebræ,	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	...	1	0.03
Tumor, not stated,	1	...	...	...	...	1	...	...	1	...	...	...	...	...	1	....	...	...	...	1	1	2	0.07
Total,	38	45	3	4	30	32	53	...	2	...	2	...	2	1	6	5	34	39	8	71	81	152	5.20
Violent Causes.																							
Homicide, by shooting,	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	....	1	...	1	0.03
Homicide, not stated,	2	...	1	...	...	...	...	...	...	...	...	2	...	1	...	....	...	...	...	3	...	3	0.10
Infanticide,	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	....	...	...	...	1	...	1	0.03
Suicide, by shooting,	3	...	1	...	4	...	...	...	...	...	...	..	3	2	2	1	...	...	....	8	...	8	0.27
" by hanging,	1	1	...	...	1	1	...	...	...	...	...	...	1	1	1	1	...	....	...	2	2	4	0.14
" by drowning,	...	1	...	...	2	...	...	...	...	...	...	1	1	...	1	...	...	...	...	2	1	3	0.10
" by oxalic acid,	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	1	0.04
" not stated,	...	...	1	...	3	2	...	...	...	...	...	...	1	2	3	...	...	...	...	4	2	6	0.21
Poison, not stated,	1	1	...	...	...	...	...	1	1	...	...	...	...	...	...	..	...	...	...	1	1	2	0.07
" alcohol,	3	4	...	...	7	8	...	...	...	...	...	2	3	5	8	4	...	...	...	10	12	22	0.75
" opium,	1	..	...	...	...	1	...	...	...	...	...	...	1	...	1	...	...	...	...	1	1	2	0.07
Asphyxia, not stated,	2	...	...	...	...	...	2	...	...	...	...	...	...	...	....	...	...	...	...	2	...	2	0.07
" by drowning,	6	...	1	...	3	...	...	...	...	5	2	...	..	2	1	...	...	...	...	10	...	10	0.34
" by overlying,	...	2	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	2	2	0.07
" by crushing,	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	1	0.03
Fracture, not stated,	...	...	...	...	1	1	...	...	...	...	...	...	1	1	...	...	...	...	...	1	1	2	0.07

Consolidated Abstract of Deaths in Pittsburgh, etc.—Continued.

CAUSES OF DEATH.	NATIVITY.						AGE.													Total by sexes.		Total, both sexes.	Percentage of each cause, on total.
	UNITED STATES.				FOREIGN.																		
	White.		Black.																				
	M	F	M	F		F	Under one year.	1	2	5	10	20	30	40	50	60	70	80	90	M	F		
Violent Causes.—Continued.																							
Fracture, of skull,	3	....	....	....	2	....	....	....	....	....	....	1	2	....	2	....	....	....	....	5	....	5	0.17
" of cervical vertebræ,	....	1	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	1	1	0.03
" of spine,	....	....	....	....	3	....	....	....	....	....	....	1	1	....	1	....	....	....	....	3	....	3	0.10
" of femur,	....	....	....	....	1	1	....	....	....	..	....	....	....	1	.. .	....	....	....	1	1	1	2	0 07
" of tibia,	....	....	..	....	....	1	....	....	....	....	....	....	....	1	....	....	....	....	....	....	1	1	0.03
" of leg,	....	....	....	....	1	....	....	....	....	....	....	....	....	1	....	....	....	....	....	1	....	1	0.03
Burns and scalds,	8	10	....	....	1	1	....	3	8	3	2	. ..	....	2	1	....	....	....	1	9	11	20	0.69
Falls,	5	....	....	....	8	4	....	....	1	....	....	1	3	3	2	2	4	1	....	13	4	17	0.58
Lightning,	1	....	....	....	....	1	....	....	....	....	....	....	1	1	....	....	....	....	....	1	1	2	0.07
Exposure,	2	....	....	....	....	1	1	....	....	....	....	....	1	....	....	1	....	....	....	2	1	3	0.10
Railroad injuries,	14	....		....	9	2	....	....	....	2	2	8	5	3	5	1	....	. ..	....	24	2	26	0.89
Run over by vehicles,	....	2	....	....	1	....	....	1	1	....	....	....	....	....	....	1	....	....	....	1	2	3	0.10
Multiple injury,	7	1	....	....	1	....	....	....	3	1	2	1	2	....	....	....	....	....	....	8	1	9	0.31
Ovariotomy,	....	1	....	....	....	1	....	....	....	....	....	....	1	1	....	....	....	....	....	....	2	2	0.07
Lithotomy,	....	1	....	....	1	....	....	....	....	....	....	....	1	....	1	....	....	....	....	1	1	2	0 07
Amputation of leg,	....	....	....	1	1	....	....	....	....	....	....	....	....	....	1	....	1	....	.. .	1	1	2	0.07
Instrumental delivery,	....	1	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	0.03
Strangled during delivery,	1	....	....	....	....	....	1	....	....	..	....	....	....	....	..	....	....	....	....	1	....	1	0.04
Hemorrhage of umbilicus,	....	1	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	0.03
Injury, not stated,	....	....	....	....	1	....	....	....	....	....	....	....	....	....	1	....	....	....	....	1	....	1	0 04
Total,	62	27	6	1	51	26	8	6	15	11	8	17	31	27	31	11	5	1	2	119	54	173	5.92
Unknown causes,	66	66	7	4	10	6	125	2	2	3	1	3	3	5	9	6	....	....	....	83	76	159	5.44
Total deaths from all causes,	1,114	1,065	56	44	363	281	786	345	350	211	133	224	208	169	175	167	96	48	11	1,533	1,390	2,923	100.00

There occurred, during the year, 2,923 deaths, a weekly average of 56. 1,832 were born in Pittsburgh, and 436 in other parts of the United States, making of native born a total of 2,268. Of this number, 100 were black, 642 were born in foreign countries, 2 were born at sea, and the nativity of 11 of the decedents was not stated on the certificates of death. The annexed statements exhibit the nativity, social condition and location of the decedents:

Pittsburgh,	1,832	Switzerland,	2
United States,	436	Austria,	2
Ireland,	282	Poland,	2
Germany,	237	Nova Scotia,	1
England,	58	Cuba,	1
Wales,	32	Russia,	1
Scotland,	10	Atlantic Ocean,	2
France,	8	Not stated,	11
Canada,	4		
Italy,	2	Total,	2,923

SOCIAL CONDITION.

Single,	2,044	Widowers	38
Married,	722	Not stated,	15
Widows,	104		
		Total,	2,923

LOCATION.

City wards,(see Table No. III.,)	2,800	Orphan Asylum,	3
West Pa. Hospital,	49	Home for Destitute,	1
Mercy Hospital,	23	Central Station,	1
St. Franciscus Hospital,	16	Found in Rivers,	5
Pittsburgh Infirmary,	16		
Homœpathic Hospital,	9	Total,	2,923

786 of the decedents were infants under one year of age, and 695 were children between the ages of one and five years, making 50.66 per cent. of the total mortality. Estimating the population at 150,000, the death rate was equal to 19.49 per 1,000 inhabitants.

GENERAL DISEASES (A).

Infectious diseases caused 761 deaths, making 26 per cent. of the total mortality from all causes, against 31.46 per cent for the previous year.

The diseases of this class caused a native mortality of 720, of which number 13 were black. The mortality of persons of foreign birth was 41. 69 were infants under one year, and 408 were children between the ages of one and five years, making 62.68 per cent. of the total.

The following table exhibits the number of deaths caused by infectious diseases during the year 1879, contrasted with the preceding six years; also, the aggregate for seven years, from 1873 to to 1879, inclusive.

TABLE No. II.

	1879.	1878.	1877.	1876.	1875.	1874.	1873.	Aggreg't. for seven years.
Measles, - -	54	4	39	37	15	71	47	267
Whooping-cough, -	62	53	136	24	55	79	57	466
Diphtheria, - -	354	483	401	77	64	53	73	1,505
Small-pox, - -	1	113	269	86	29	...	25	523
Scarlet fever, -	95	94	95	93	208	313	122	1,020
Typhoid fever, - -	91	115	71	84	121	149	194	825
Cerebro-spinal fever,	6	2	4	2	20	18	103	155
Malarial fevers, -	6	6	7	8	8	6	6	47
Puerperal fever, -	5	7	3	6	13	13	14	61
Erysipelas, - -	7	6	12	14	15	16	30	100
Pyemia, - -	2	1	6	8	2	7	9	35
Simple cholera, -	10	9	13	11	12	30	17	102
Choleraic diarrhœa,	68	72	85	144	208	241	256	1,074
Total, - - -	761	965	1,141	594	770	966	946	6,180
Total deaths from all causes	2,923	3,068	3,408	2,896	2,957	3,381	3,519	22,152
Per cent. of infectious diseases on total mortality,	26.03	31.46	33.48	20.51	26.04	29.46	26.88	27.90

The annexed statement exhibits the percentage of infectious diseases on the total mortality in each of the three divisions of the city, viz., the Old City, East End and South Side, for the past five years. The Old City comprises the first twelve wards; the East End comprises the Thirteenth to the Twenty-third wards, inclusive; the South Side comprises the Twenty-fourth to the Thirty-sixth wards, inclusive.

DISTRICT.	1879.	1878.	1877.	1876.	1875.
Old City, . . .	22.8	28.1	27.7	18.8	25.5
East End, . .	24.3	20.4	17.7	17.6	29.3
South Side, . .	34.4	41.1	44.7	24.5	27.4

It will be observed that in 1875 the highest percentage of mortality from infectious diseases was in the East End, and, for the four succeeding years, on the South Side. The mortality from infectious diseases was greatest in the Old City during 1878. In the East End, infectious diseases have been steadily increasing during the past three years, while on the South Side they have been decreasing for the past two years. In 1877, infectious diseases caused almost one-half of the total mortality on the South Side.

Table No. III. exhibits the location of the mortality from infectious diseases, and also the percentage in each ward on the total mortality of the ward. The Twenty-fourth, Twenty-fifth and

Twenty-sixth wards, show, in the order named, the highest percentage of mortality from infectious diseases.

TABLE No. III.

Deaths from General Diseases (A), registered during the twelve months ending December 31st, 1879.

WARDS.	Small-pox.	Measles.	Scarlet fever.	Diphtheria.	Whooping cough.	Typhoid fever.	Cerebro-spinal fever.	Choleraic diarrhœa.	All other Diseases included in Class A.	Total Deaths from Diseases included in Class A.	Total Deaths from all Causes.	Percentage of Deaths from Diseases comprised in Class A on Total Mortality.
First,	...	5	1	8	3	3	...	6	...	26	97	26.8
Second,	...	1	3	1	...	4	1	1	1	12	66	18.2
Third.	...	...	...	5	...	...	...	3	...	8	44	18.2
Fourth,	...	1	...	7	...	2	...	1	...	11	41	26.8
Fifth,	...	...	3	2	4	...	...	1	...	10	80	12.5
Sixth,	...	3	8	13	3	6	..	2	1	36	136	26.5
Seventh,	...	1	1	5	3	7	...	3	..	20	104	19.2
Eighth,	...	...	1	6	...	2	...	2	2	13	82	15.9
Ninth,	....	1	3	9	5	2	...	3	...	23	93	24.7
Tenth,	...	...	5	5	2	...	1	2	...	15	45	33.3
Eleventh,	...	4	...	7	...	5	...	2	2	20	106	18.9
Twelfth,	...	6	...	20	7	8	...	1	2	44	150	29.3
Thirteenth,	...	...	5	12	12	3	...	...	...	32	101	31.7
Fourteenth,	...	3	4	9	1	3	1	1	1	23	120	19.2
Fifteenth,	....	...	1	21	2	2	...	3	1	30	103	29.1
Sixteenth,	...	...	5	14	2	5	...	3	2	31	106	29.2
Seventeenth,	...	...	1	23	4	3	...	2	...	33	132	25.0
Eighteenth,	...	...	3	3	...	3	...	1	1	11	39	28.2
Nineteenth,	...	...	...	3	...	1	...	...	1	5	54	9.3
Twentieth,	...	....	1	9	...	3	....	2	...	15	59	25.4
Twenty-first,	1	...	6	1	1	2	...	1	1	13	72	18.1
Twenty-second,	...	...	...	5	...	1	...	...	...	6	29	20.7
Twenty-third,	...	...	...	7	...	...	....	...	...	7	32	21.9
Twenty-fourth,	...	2	10	42	3	2	...	2	...	61	96	63.5
Twenty-fifth,	....	4	4	36	...	1	1	4	2	52	132	39.4
Twenty-sixth,	...	6	5	21	7	5	....	5	2	51	135	37.8
Twenty-seventh,	...	4	8	12	1	2	...	4	1	32	97	33.0
Twenty-eighth,	....	2	7	13	1	3	....	2	1	29	87	33.3
Twenty-ninth,	...	3	5	10	...	3	1	3	1	26	82	31.7
Thirtieth,	...	5	2	3	1	3	...	2	1	17	64	26.6
Thirty-first,	...	...	1	...	...	...	...	1	1	3	23	13.0
Thirty-second,	...	1	...	7	...	1	1	2	...	12	55	21.8
Thirty-third,	...	....	...	1	...	1	....	2	...	4	17	23 5
Thirty-fourth,	...	1	2	....	.	...	....	1	....	4	40	10.0
Thirty-fifth,	...	....	..	6	....	1	....	....	2	9	26	34.6
Thirty-sixth,	...	1	....	8	....	....	....	....	4	13	55	23,6
Total,	1	54	95	354	62	87	6	68	30	757	2,800	27.1
Hospitals & Institutions,	...	...	...	....	...	4	....	...	...	4	123	3.3
Total,	1	54	95	354	62	91	6	68	30	761	2,923	26.0

The annexed statement shows the number of deaths per month from typhoid fever during the past seven years. June shows the lowest, and October the highest mortality from this cause.

TYPHOID FEVER.

MONTHS.	1879.	1878.	1877.	1876.	1875.	1874.	1873.	7 years' Aggregate.
January, . .	8	11	5	11	13	15	9	72
February, .	6	9	3	5	5	15	9	52
March, . .	10	3	...	9	12	15	7	56
April, . .	4	7	6	13	4	5	16	55
May, . . .	3	11	4	4	8	3	34	67
June, . .	1	8	2	4	4	2	15	36
July, . . .	3	11	4	...	6	7	15	46
August, . .	7	16	6	8	12	11	28	88
September, .	15	13	8	11	18	9	18	92
October, . .	12	13	15	7	20	30	18	115
November, .	14	8	9	7	12	12	15	77
December, .	8	5	9	5	6	25	7	65
Total, . .	91	115	71	84	120	149	191	821

The annexed statement exhibits the number of deaths per month from consumption during the past seven years. The month of September shows the lowest and April the highest mortality.

CONSUMPTION.

MONTHS.	1879.	1878.	1877.	1876.	1875.	1874.	1873.	7 years' Aggregate.
January, . .	28	36	23	21	31	33	26	198
February, .	31	25	31	28	30	22	24	191
March, . .	24	29	26	44	39	27	27	216
April, . .	21	29	27	33	39	40	36	225
May, . . .	20	39	28	33	33	39	25	217
June, . .	22	25	31	31	26	24	27	186
July, . . .	19	25	21	26	23	21	34	169
August, . .	23	25	26	25	28	22	24	173
September, .	22	17	19	17	25	24	22	146
October, .	17	25	22	25	24	26	27	166
November, .	20	18	20	30	18	25	31	162
December, .	14	22	27	28	29	28	23	171
Total, . .	261	315	301	341	345	331	326	2,220

STILL BIRTHS.

The number of dead born infants reported during the year was 266, an increase of 18 as compared with the previous year. The annexed statement shows the number of cases in which the cause of the dead birth was stated by the attendant.

CAUSES AFFECTING THE MOTHER.

Difficult and protracted labor,	12
Injury—falls,	3
" not stated,	2
Over-exertion,	3
Syphilis,	10
Bright's disease,	1
Illness, not stated.	5
Exposure,	2
Uterine disease, not stated,	3
Fright,	3
Inertia of uterus,	2
Malformation of pelvis,	7
Total,	53

CAUSES AFFECTING THE FŒTUS.

Abnormal presentation,	2
Breech "	6
Shoulder "	4
Arm "	1
Face "	1
Placenta prævia,	6
Prolapsus of cord,	11
Hydrocephalus,	6
Disease of placenta, not stated,	1
Debility—twins,	4
Suffocation during labor,	7
Instrumental delivery,	2
Total,	51

Return of Still Births, showing the Sex and period of Utero-gestation, Registered during the Twelve Months ending December 31st, 1879.

MONTHS.	Total.	SEX.			PERIOD OF UTERO-GESTATION.								
		Males.	Females.	Not stated.	2d Month.	3d Month.	4th Month.	5th Month.	6th Month.	7th Month.	8th Month.	9th Month.	Not stated.
January, - -	17	10	6	1	....	....	....	1	1	2	....	4	9
February, -	20	11	9	...	....	....	....	...	2	...	....	6	12
March, - -	20	15	5	....	1	....	....	....	2	2	....	4	11
April, - -	18	11	7	....	....	1	....	3	....	2	....	2	10
May, - - -	20	13	7	....	....	....	....	....	....	2	1	2	15
June, - -	22	13	9	....	....	....	1	....	1	4	1	5	10
July, - - -	26	12	13	1	....	1	....	1	1	2	3	4	14
August, - -	26	9	15	2	....	1	1	....	1	1	1	8	13
September, -	24	10	12	2	1	....	....	...	...	...	1	6	16
October, - -	20	6	13	1	....	....	....	1	1	5	1	2	10
November, -	24	18	5	1	1	....	....	...	2	2	1	4	14
December, -	29	19	10	....	....	....	....	...	1	2	1	4	21
Total, - -	266	147	111	8	3	3	2	6	12	24	10	51	155

BIRTHS.

The number of living infants born in this city during the past year, whose births have been recorded in this office, was 4,449, an increase of 270 as compared with the previous year, and a decrease of 192 as compared with the average for the six preceding years Estimating the population of the city at 150,000 the birth rate was equal to 29.66 per 1,000. It is probable that at least 25 per cent. of the births which occur annually are unregistered because of the carelessness of parents, physicians and midwives.

The number of births per month is shown in the following statement:

MONTHS.	White Males.	White Females.	Black Males.	Black Females.	Total White.	Total Black.	Total.
January, - - -	229	194	2	1	423	3	426
February, - -	183	177	3	5	360	8	368
March, - - - -	196	186	...	3	382	3	385
April, - - -	131	140	...	3	271	3	274
May, - - - -	159	164	2	7	323	9	332
June, - - -	164	159	1	4	323	5	328
July, - - - -	206	193	7	2	399	9	408
August, - - -	196	207	2	2	403	4	407
September, - - -	208	190	...	3	398	3	401
October, - - -	200	175	3	5	375	8	383
November, - - -	198	155	5	2	353	7	360
December, - -	184	182	7	4	366	11	377
	2,254	2,122	32	41	4,376	73	4,449

The following statement exhibits the number of births in each ward. As compared with the preceding year, there is a decrease in some of the most thickly inhabited wards, while the more thinly populated rural wards show an increase:

WARDS.	BIRTHS.	WARDS.	BIRTHS.
First, - - - - -	122	Twentieth, - - -	101
Second, - - - -	57	Twenty-first, - - -	144
Third, - - - - -	59	Twenty-second, - -	27
Fourth, - - - -	46	Twenty-third, - - -	47
Fifth, - - - - -	130	Twenty-fourth, - -	85
Sixth, - - - - -	251	Twenty-fifth, - - -	155
Seventh, - - - -	147	Twenty-sixth, - - -	281
Eighth, - - - -	141	Twenty-seventh, - -	128
Ninth, - - - -	120	Twenty-eighth, - -	144
Tenth, - - - -	59	Twenty-ninth, - - -	99
Eleventh, - - - -	200	Thirtieth, - - -	74
Twelfth, - - - -	239	Thirty-first, - - -	74
Thirteenth, - - -	114	Thirty-second, - -	113
Fourteenth, - - -	226	Thirty-third, - - -	47
Fifteenth, - - - -	163	Thirty-fourth, - - -	46
Sixteenth, - - -	214	Thirty-fifth, - - -	44
Seventeenth, - - -	254	Thirty-sixth, - - -	82
Eighteenth, - - -	79	West Penn. Hospital. - -	23
Nineteenth, - - -	101	Homœopathic Hospital, -	13

MARRIAGES.

The number of marriages solemnized in this city during the year, and recorded in this office, was 1,290—an increase of 116 over the previous year, and a decrease of 26 as compared with the average for the previous six years.

The following statement shows the aggregate, average and number by months, for the year 1879, *with the corresponding figures for the six preceding years:*

MONTHS.	1879	1878	1877	1876	1875	1874	1873	7 years aggregate.	7 years average
January, - -	96	99	88	105	103	121	164	776	111
February, -	102	108	101	96	77	127	143	754	108
March, - -	65	95	65	89	82	90	91	577	82
April, - -	105	103	126	99	108	154	164	859	123
May, - - -	100	116	110	110	100	135	184	855	122
June, - -	115	93	85	109	121	120	153	796	114
July, - - -	87	102	82	68	94	120	185	738	105
August, - -	110	63	62	84	95	116	117	647	92
September, - -	110	92	94	93	125	157	171	842	120
October, - -	132	99	100	103	107	138	172	851	122
November, - -	134	103	109	88	94	136	133	797	114
December, -	134	101	88	74	86	119	105	707	101
Total, - -	1,290	1,174	1,110	1,118	1,192	1,533	1,782	9,199	1,314

The following statement shows the ages of persons married during the year 1879:

YEARS.	Grooms.	Brides.
15 to 20,	8	290
20 to 25,	509	631
25 to 30,	441	209
30 to 35,	145	62
35 to 40,	74	38
40 to 45,	39	21
45 to 50,	35	11
50 to 55,	14	11
55 to 60,	6	2
60 to 65,	6	...
65 to 70,	1	1
Not stated,	12	14
Total,	1,290	1,290

The following statement shows the ceremonies employed:

Civil,	186
Catholic,	364
Methodist,	264
Presbyterian,	145
United Evangelical,	108
Lutheran,	95
Episcopal,	56
Baptist,	42
Evangelical Association,	14
German Reformed,	8
Hebrew,	7
German Protestant,	1
Total,	1,290

The following statement shows the Nativity of persons Married during the year 1879:

	Grooms.	Brides.
Pittsburgh,	302	433
Other parts of U. S.,	515	503
Ireland,	128	114
Germany,	192	118
England,	54	48
Scotland,	14	13
Wales,	25	13
Canada,	8	2
Nova Scotia,	.....	1
New Brunswick,	......	1
Sweden,	2	2
Norway,	.....	1
Russia,	2	1
Austria,	5	5
Poland,	2	......
Italy,	8	6
Denmark,	1	......
Belgium,	2	1
France,	8	5
Switzerland,	7	8
West Indies,	1	.....
Mexico,	1	.....
Not stated,	13	15
Total,	1,290	1,290

The following table shows the number of Births, Marriages and Deaths recorded in this department since its organization:

YEARS.	Births.	Marriages.	Deaths.
1852 (six months), - -	......	......	365
1853, - - -	......	......	898
1854, - - - -	......	......	1,831
1855, - - -	......	......	1,000
1856, - - - -	.. ...	......	815
1857, - - -	......	...	943
1858, - - - -	......	.....	888
1859, - - -	......	......	820
1860, - - - -	......	......	860
1861, - - -	......	......	948
1862, - - - -	......	......	1,066
1863, - - -	......	......	998
1864, - - - -	......	......	1,162
1865, - - -	......	......	999
1866, - - - -	......	......	1,070
1867, - - -	......	......	1,042
1868, - - - -	......	......	1,233
1869, - - -	......	......	1,477
1870, (new registration act),	(6 mos.) 1,750	(6 mos.) 562	1,867
1871, - - - -	2,886	1,059	2,531
1872, - - -	3,378	1,143	2,456
1873, - - - -	5,175	1,782	3,519
1874, - - -	5,084	1,533	3,381
1875, - - - -	4,930	1,192	2,957
1876, - - -	4,264	1,118	2,896
1877, - - - -	4,215	1,110	3,408
1878, - - -	4,179	1,174	3,068
1879, - - - -	4,449	1,290	2,923
Total, - - -	38,550	11,963	47,421

Respectfully submitted,

W. SNIVELY, M. D.,
Registrar.

MEAT INSPECTOR'S REPORT.

PITTSBURGH, *January*, 1880.

To the Board of Health of the City of Pittsburgh:

GENTLEMEN:—I herewith submit a statement of the operations of this office for the year ending December 31st, 1879.

SUMMARY FOR QUARTER ENDING MARCH 31ST, 1879.

Condemned and confiscated	Beef,	1,650 lbs.
" "	Veal,	750 "
" "	Corned Beef,	300 "
" "	Pickled Eggs,	85 doz.
" "	Calves,	13 head.
" "	One crippled Bullock,	1,100 lbs.
" "	Dressed Chickens,	22 pairs.
" "	Milk,	32 gals.

SUMMARY FOR QUARTER ENDING JUNE 30TH, 1879.

Condemned and confiscated	Beef,	1,130 lbs.
" "	Veal,	550 "
" "	Corned Beef,	400 "
" "	Pickled Eggs,	85 doz.
" "	Calves,	6 head.
" "	Dressed Chickens,	83 pairs.
" "	Milk,	223 gals.

Eight persons were arrested and fined for selling adulterated or impure milk.

Three persons engaged in the milk business were arrested and fined for running their milk wagons without their names being placed thereon, in violation of Act of Assembly.

Information was made before Alderman Bradley, Twenty-first ward, and warrant issued against a party for selling spoiled hams form a wagon.

SUMMARY FOR QUARTER ENDING SEPTEMBER 30TH, 1879.

Condemned and confiscated	Beef,	450 lbs.
" "	Veal,	135 "
" "	Corned Beef,	75 "
" "	Calves,	1 head.
" "	Dressed Chickens,	32 pairs.
" "	Milk,	62 gals.
" "	Fish,	11 bbls.

Three persons were arrested and fined twenty-five dollars, each, for selling milk adulterated with water and other substances.

One calf, condemned and confiscated, was committed to the Guardians of the Poor.

SUMMARY FOR QUARTER ENDING DECEMBER 31, 1879.

Condemned and confiscated		Beef,	3,800 lbs.
"	"	Mutton	750 "
"	"	Veal,	500 "
"	"	Calves,	2 head.
"	"	Eggs,	35 doz.
"	"	Fish,	600 lbs.
"	"	Venison,	1,000 "
"	"	Dressed Poultry,	80 bbls.
"	"	Pheasants,	9 "
"	"	Squirrels,	7 "
"	"	Partridges & Prairie Chickens,	200 pairs.
"	"	Rabbits,	21 bbls.

Two persons were arrested and fined twenty-five dollars, each, for selling milk adulterated with water and other substances, in violation of Act of Assembly.

RECAPITULATION.

Condemned and confiscated		Beef,	8,130 lbs.
"	"	Veal,	1,935 "
"	"	Calves,	22 head.
"	"	Eggs,	205 doz.
"	"	One Bullock,	1,100 lbs.
"	"	Chickens,	137 pairs.
"	"	Milk,	285 gals.
"	"	Fish,	2,800 lbs.
"	"	Venison,	1,000 "
"	"	Dressed Poultry,	12,000 "
"	"	Pheasants,	1,350 "
"	"	Squirrels,	1,050 "
"	"	Partridges & Prairie Chickens,	200 pairs.
"	"	Rabbits,	3,150 lbs.

Respectfully submitted,

THOMAS W. LINDSAY,
Meat Inspector.

ATTORNEY'S REPORT.

PITTSBURGH, *January*, 1880.

To the Board of Health of the City of Pittsburgh:

GENTLEMEN:—As Solicitor of your Board, I have the honor to make the following report for the year 1879:

The whole number of suits brought during the year was sixteen, five of which were discontinued, and two are still pending. In nine, judgments were recovered for the Board, but in four of these appeals were taken and filed in Common Pleas Courts. There has been considerably less than the usual amount of suits brought this year, which is owing to a better understanding of the laws by the people who are likely to violate them, and to the fact that the Sanitary Inspectors are becoming more efficient and are more successful in their endeavors to abate nuisances without resorting to litigation.

Respectfully submitted,

H. H. MCCORMICK,
Solicitor.

TREASURER'S REPORT.

PITTSBURGH, *February*, 1880.

To the Board of Health:

GENTLEMEN:—I have the honor to submit the following statement of the receipts and expenditures of this department during the fiscal year ending January 31st, 1880:

RECEIPTS.

Balance on hand Feb. 1st. 1879,	$ 199 30	
Appropriation by City Councils,	12,000 00	
Office receipts per Health Officer,	1,577 50	
		$13,776 80

EXPENDITURES.

SALARIES—		
Health Officer,	$1,200 00	
Physician and Registrar,	1,000 00	
Meat and Milk Inspector.	1,500 00	
Attorney,	250 00	
Registration Clerk,	900 00	
Sanitary Inspectors,	3,300 00	
		$8,150 00
HOSPITAL EXPENSES—		
Nurse hire,	$520 00	
Groceries and produce,	156 38	
Milk,	33 51	
Hauling water, &c.,	25 40	
Fuel,	103 96	
Repairs,	400 00	
Painting,	244 00	
Repairing furnace,	55 00	
Lumber,	3 68	
Weather strip,	24 00	
Window shades.	29 90	
Trees,	24 00	
Carriage hire,	6 00	
Miscellaneous bills,	32 65	
		$1,658 48

GENERAL EXPENSES—			
Removing dead animals,	$1,000 00		
Printing,	381 16		
Stationery,	56 13		
Advertising,	24 20		
Subscription daily papers,	24 00		
Office expenses,	147 13		
Vaccine virus,	30 00		
Safe,	105 75		
Miscellaneous bills,	15 10		
		$1,783 47	
			11,591 95
Balance on hand,			$2,184 85

Respectfully submitted,
ADDISON ARTHURS,
Treasurer.

To the Board of Health:

GENTLEMEN:—Your Finance Committee, to whom was referred the foregoing statement, respectfully report that they have examined the same, and find it correct.

J. F. SLAGLE,
J. D. THOMAS,
JARED M. BRUSH,
Finance Committee.

Pittsburgh, February, 1880.

APPENDIX.

REPORT OF THE
SPECIAL COMMITTEE
OF THE
BOARD OF HEALTH

Appointed to investigate regarding the origin and prevalence of Typhoid fever—reported epidemic—in the South Side wards of the city of Pittsburgh, and with instructions to suggest remedies.

Committee.
Dr. W. J. Asdale, *Chairman.*
Dr. W. Snively, *Secretary.*
Dr. T. P. Graham.

Submitted, May 31st, 1880.

To the Board of Health:

Gentlemen:—Your committee desire to present the following report:

Shortly after receiving our appointment the services of Prof. Francis C. Phillips and Mr. T. P. Roberts, C. E., were engaged. The first named gentleman was employed to furnish a chemical analysis of the water taken from the river and also of the water taken from the wells in use in the affected district, this in compliance with instructions received from you and chiefly in deference to the popular idea existing amongst that portion of our community most involved, that the drinking water supplied is or had been to blame.

Mr. Roberts was required to furnish data concerning the sources of supply and liability to contamination of the water of the Monongahela river, from whence the South Side reservoir is filled; also, information in regard to the character, natural and artificial, of the ground upon which that portion is located, with reference to the source and probable constitution of the water found in wells of that neighborhood and in use; further, to suggest a plan of drainage that may be there efficiently applied.

The results of the careful examination, by Prof. Phillips, of the different samples of water submitted to him for scientific analysis have furnished evidence, strongly corroborated by other existing facts, highly important when viewed in connection, of a value which cannot be overestimated, involving the most vital interest of every individual.

The patient and painstaking zeal of Mr. Roberts has enabled that capable and industrious officer to present an amount of information regarding the matter with which he was specially charged—elaborate, systematic and altogether satisfactory.

For the charts illustrative of the text we are indebted to Mr. Roberts.

MR. ROBERTS' REPORT.

PITTSBURGH, *May* 11*th*, 1880.

To Special Committee of Board of Health:

GENTLEMEN:—With the understanding that the general range of your investigations would embrace the subject of the Monongahela river as a source of general water supply, I have thought it best to prefix to my report some observations on this river which may prove of interest, and which, it occurs to me, should be known before discussing the matters upon which you desired me to specially report.

THE MONONGAHELA RIVER.

Area of its Valley, Chief Tributaries, its Fish, etc.—The Monongahela river, proper, is formed by the junction of the Tygarts Valley and West Fork rivers, which unite about one mile south of the town of Fairmont, West Virginia. The Tygarts Valley enters from the east and is the parent stream, being much the larger of the two. It heads in Upshur county, West Virginia, its sources interlocking with the heads of the Great Kanawha, and they lie near those of the James river. Its length is 135 miles. From the junction to Pittsburgh the distance is 130 miles, making the total length of the river, by the meanderings of the stream, 265 miles. The aggregate area drained by the Monongahela is estimated at 7,000 square miles.

The Cheat, which is fully as long and as large as the Tygarts Valley river, enters the main stream just north of the Pennsylvania and West Virginia boundary. It, like the Tygarts Valley, comes from the mountains, and is a perennial and powerful source of supply. The next important tributary is the Youghiogheny, which enters at McKeesport, 15 miles above Pittsburgh, and it also comes from the mountains. The west side tributaries of the river are short and unimportant, and, in seasons of drought, they become, for the most part, dry.

The main body, or reliable volume, of the river, is made up from the waters of the three rivers mentioned, and their waters remain clear and pure until they discharge into the main channel, and all of them abound more or less with "game fish," such as bass, perch, pike, etc., which are also found in the Monongahela, notwithstanding its muddiness, all the way to the City of Pittsburgh, though from various causes they are diminishing in numbers in the main stream.

It is the opinion of some writers, I might mention Prof. Albert Leeds as one, that the presence of game fish in streams is the surest and safest criterion of the healthfulness of the water. A very small quantity of acid, or sewage, matter, thrown into streams of considerable size, has been known to drive away trout, etc. I will mention that the prime cause assigned to account for the diminution in number of the bass in the Monongahela of late years, is the sulphurous and acid waters emanating from the coal mines. But while it is believed the presence of certain species of fish is a positive sign of purity, their absence is only negative evidence that the impurities which keep them away are hurtful to human beings. Thus, it is known that the acid refuse from one single oil refinery on the Allegheny has destroyed bass life for sixty miles below, yet no one will seriously affirm that a little sulphuric acid in water could be detrimental to the human system. Other varieties of fish, with a less sensitive organization, such as "suckers," can exist within a short distance of refineries, and still others are such "hardened criminals," *e. g.*, the so-called "alligator," seem perfectly impervious to acid, tar, or sewage matter. It is held by some that not only animal but plant life in water is graduated in scale by the proportion of oxygen the water contains, and that the water becomes polluted, as far as these organisms are concerned, from sewers, etc., discharging liquids, in which little oxygen exists. But in the case of the Allegheny it can safely be presumed that one refinery could not deprive the entire river for sixty miles of the oxygen necessary to bass life, so that I believe this particular theory will not hold—it is not sufficient to account for the facts. I have, in the course of my experience in river surveys, etc., given the study of fish, in connection with the pollution of rivers, some attention, and in this way have come to consider the fish test better than ordinary analysis of samples, because one single fish may be taken as the exponent of a considerable portion of a large stream, and further, for the reason that I believe the digestive functions of the fish will not fail to take notice of the organic impurities which sometimes escape the observation of the chemist. On the strength of this faith, therefore, I would say that the waters of the Monongahela, down to Dam No. 1, are still pure.

The Color of the River Water, Etc.—No two neighboring rivers probably present more characteristic differences than the two which unite at this city to form the Ohio. The Allegheny is a clear, sparkling stream, abounding with rapids, and flowing over a bed of rocks, pebbles and boulders. For two hundred miles above Pittsburgh its average descent is about two and one-half feet per mile. The name given it by the Seneca Indians, which we still retain, is expressive, viz: "fair" or "clear water," and is in sharp contradistinction to "Monongahela," also an Indian word, and believed to signify "muddy water." At all events from time immemorial the Monongahela was never known to be perfectly clear or transparent, even in its lowest stages, although it gradually approximates to clearness after remaining for a considerable period at a low stage. But as the slightest showers, sufficient to produce freshets in any of its small tributaries, immediately restore its fading color, there is no hope of ever seeing it perfectly clear.

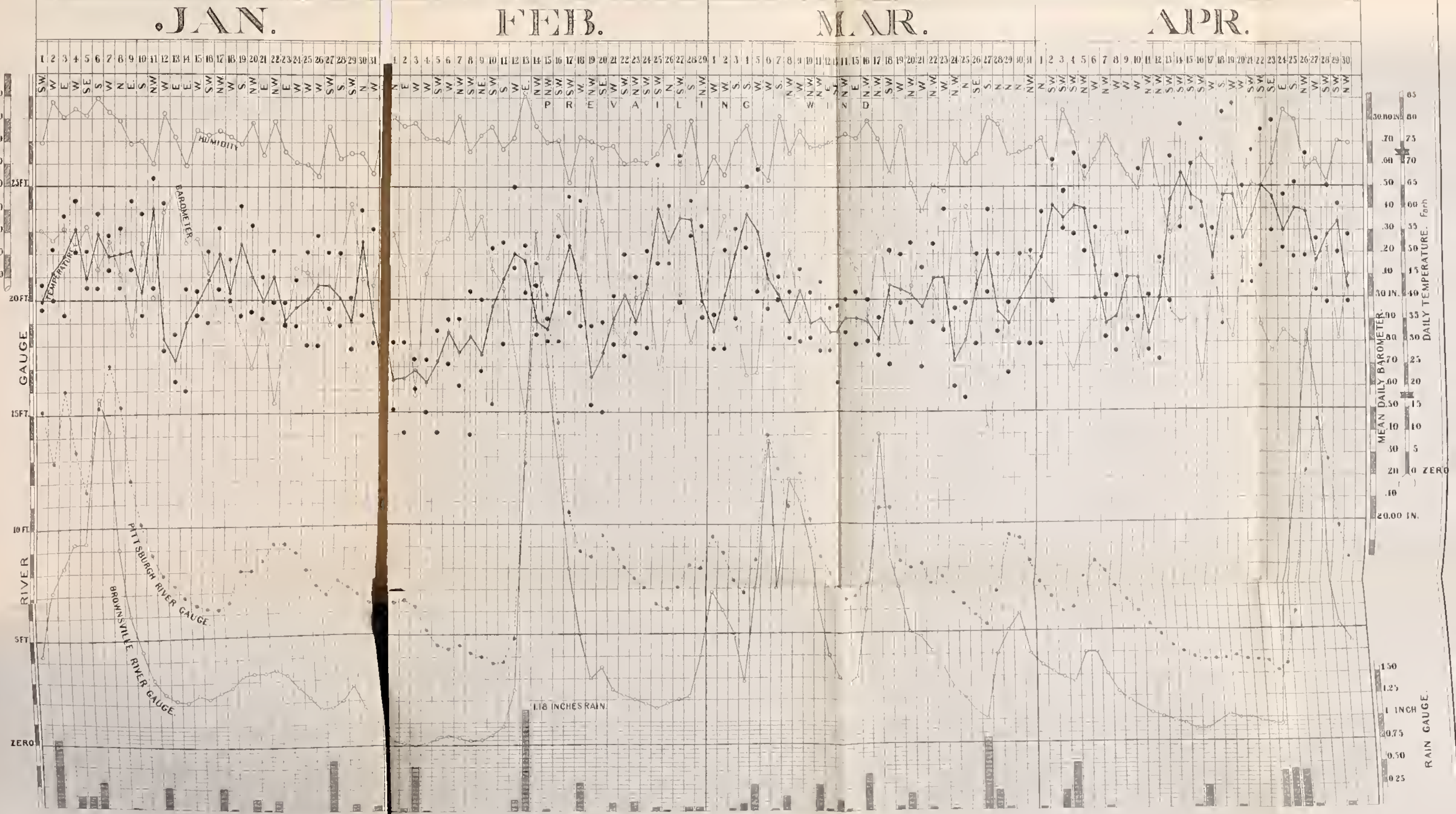
While, as before stated, the Tygarts Valley, the Cheat, and the Youghiogheny rivers, which furnish its main volume, are as a rule as pure as the waters of the Allegheny, they lose their transparency as soon as they enter the main trough of the valley. The cause of the sudden change in the appearance of their waters can be traced to, or rather depends upon the fact that the main stream has much less fall than these important tributaries. Thus the Cheat, from tumbling down over rocks with a descent of from five to twenty feet per mile from the mountains, falls into a comparative pool, the descent of which is only about one foot per mile for eighty-seven miles to Pittsburgh. In this pool the prism of water moves more slowly, particularly since the construction of the dams (six in number). Into this calm portion of the river the little streams, notably those from the west, or left, side of the river, pour in from the fertile soil of Washington and Greene counties, Pa., their heavily charged burdens of mud, the particles of which are so fine that they will remain in suspension even when the motion of the water is almost imperceptible to the eye.

As a matter of interest in this connection, I will mention that the Cheat forms an exception to the Tygarts Valley and the Youghiogheny in the matter of color, for while I have referred to it as a mountain stream, its waters when examined more closely will be observed to have a slightly dyed appearance. Where it is deep it looks under some lights almost black, as though there was something in actual solution with it; not simply colored and opaque, as clay renders water, but translucent. I will mention further that I have seen in the Black, Eau Claire, Chippewa, and the St. Croix rivers, Wisconsin, and also in the head of the Mississippi in Minnesota, also in a stream issuing from the swamps of the Bear Meadows, in Centre county, Pennsylvania, a similar dye in the waters, in some cases as dark as tan bark water in vats. My belief is that this color is not due, in any of these cases, to matter held in a state of suspension, but that it is in genuine solution. It has been said that in such cases the water has taken its color in the swamps after mingling with the roots of the tamarack, hemlock, or other conifers. The hemlock of Pennsylvania and West Virginia, and certain tamaracks are known to yield tannic acid from their barks in large proportions, and as the Cheat originates in and traverses great glades, or swamps, it is very likely that its waters in contact with fallen trees, the bark of which is in rapid process of oxidation, yielding tannic acid, would naturally take it into solution. The peculiar color of the Cheat would, no doubt, be visible here, at least to some extent, but for the earth coloring before alluded to. But this natural color is not, I believe, considered an impurity by any authority. In the West it is popularly believed that a residence on a tamarack swamp will cure the most confirmed cases of ague. Certainly no intermittent fevers have originated in the localities mentioned. But while it may be granted that such substances in water may do no harm, pure, colorless water is more gratifying to the eye. Corfield, a distinguished English authority on the hygiene of rivers, thus defines ordinary drinking water, without reference to its chemical constituents:

"Roughly speaking, a drinking water should be, in the first place, transparent. In the second place, it should be transparent to white light; that is to say, it should be transparent and without color. It must be without taste and without smell, and it must deposit no sediment on standing."

No one, of course, will claim that the water of the Monongahela fulfills these conditions, though it can be made to approximate them by being allowed to settle in reservoirs. Compart-

METEOROLOGICAL TABLE FOR PITTSBURGH, & RIVER RECORD FOR PITTSBURGH, & BROWNSVILLE,



NOTE: THE RECORD IS TAKEN FROM THE U S SIGNAL OBSERVATIONS, EXCEPTING THE BROWNSVILLE RIVER RECORD FOR THE MONTHS OF JANUARY AND APRIL, WHICH WERE TAKEN FROM THE "DISPATCH" REPORTS AND REDUCED IN EACH CASE BY 4 FEET, TO HAVE THE DATA AGREE AS NEARLY AS POSSIBLE

T. P. ROBERTS

ments were placed in our reservoirs for this express purpose, but they are never so used. There is some excuse for the South Side reservoirs, for both compartments, I understand, hold only one day's supply. If it is intended to continue their use they should be enlarged.

Discharge of the River, Nature of its bottom, etc.—The low water discharge of the Monongahela past Pittsburgh, there is reason to believe, seldom gets below 25,000 cubic feet per minute. I gauged it roughly last autumn, at Smithfield street, when I suppose it was lower than it had been for thirteen years, and I found the discharge to be about 23,000 cubic feet per minute. Last autumn, the Allegheny was lower, it is generally thought, than it was ever before known to be, though I found its discharge to be 110,000 cubic feet per minute, or about five times the discharge of the Monongahela. I had been previously led to think, by the report of the late Major Sanders, U. S. A., that in 1838 the Allegheny became so low as to pass only 80,000 cubic feet per minute, and I have no reason to doubt the accuracy of his report. In that year, which was a remarkable one, Mr. W. Milnor Roberts, C. E., gauged the Monongahela at Brownsville, and found the discharge to be 12,000 cubic feet per minute, though he states that the river declined somewhat after his measurement. But the most remarkable low water season on the Monongahela was undoubtedly in 1856. Gen. Moorhead, the President of the Monongahela Navigation Company, says that "in that summer the water appeared literally to dry up in the pools, as though the flow would not support the loss caused by evaporation." In that season, he gauged the river immediately below Lock No. 4, and he found the discharge to be 1,492 cubic feet, or 11,190 gallons per minute. Not satisfied with his own measurement, he had Mr. Chas. Stewart, C. E., gauge it a week later, and the latter gentleman reported even a smaller figure, viz.: 1,365 cubic feet per minute. I will take this opportunity to mention that it has been on the strength of the above figures that the statement has been made of the remarkable disparity in the low water discharge of the two rivers.

The high water discharge of the Monongahela can only be approximately determined. There are records of the stage of the river at Pittsburgh for many years back, and numerous gaugings have been made, but unfortunately the records refer to the channel depth of the Ohio, the marks for which are affected by the rises from the Allegheny. I think it can be shown, however, that on the 14th of February, 1880, when the gauge at Brownsville indicated 23 feet of a rise, that there was fully 11,500,000 cubic feet of water per minute passing, or calling at that point, the usual low water discharge 10,000 cubic feet per minute, the rise of the 14th equaled 1,150 times the low water flow. The great flood of 1832, which rose at Brownsville about 35 feet, must have been fully 2,000 times the usual low water discharge of the river. Enough is known to show that this river fluctuates enormously, and that no accumulations of filth, sand, or mud can collect on its bottom where exposed to its currents. General Moorhead states that the navigation has not been impeded in the open channel by deposits during the forty years since the opening of the navigation. This experience is valuable as offsetting the theories of some who prophecied that the pools would fill up. The fact is important also in the present discussion, proving, as it does, that the dams have not been the cause of any hurtful deposits in the river bed, such as might affect the health of those who use its waters.

The bed of the river is, as a rule, composed of fine gravel and sand, with occasional rocky places. On the few occasions in which the pools have been drained out, there was exhibited in general the original shape of the bars, etc., though the bottom is now heavily littered with coal which has been lost by the wrecking of numerous boats.

The Sources and Extent of Injurious Pollution of the River.—This was one of the questions to which my attention was pointedly directed. It naturally divides itself into two parts, and first as to the entire river as a body.

For the purpose of estimating the possible extent of the sewage which enters the waters of the Monongahela above Pittsburgh I have taken as a basis, the population of the towns up to and including Brownsville, 55 miles, [population deduced from the vote of October, 1879]. The following is the showing:

Braddocks, - - - - -	2,328	inhabitants.
McKeesport, - - - -	5,106	"
Elizabeth, - - - - -	1,950	"
West Elizabeth, - - - -	846	"
California, - - - - -	1,062	"
Belle Vernon, - - - -	930	"
Monongahela City, - - - -	3,552	"
Fayette City, - - - -	948	"
Greenfield, - - - - -	1,224	"
Glenfield, - - - - -	516	"
Webster, - - - - -	1,146	"
Brownsville, - - - -	2,658	"
Total, - - - - -	22,268	"

It would be safe to double this number in order to include the scattered hamlets which cluster so thickly in the neighborhood of the mines. We have here a total population of, say, 45,000, within a distance of 55 miles, resident on the banks of the Monongahela and the Youghiogheny. When I came to inquire into the character of the sewage from these places, I learned that not one of them possessed water works, and that therefore there was no system of sewerage, and that the use of privy-vaults was universal. Such being the facts, it follows that the river receives nothing hurtful or contaminating from these places. There are a few manufactories, the refuse from which passes into the river, but on the whole they are trifling in number and extent as compared with the establishments on the Schuylkill, above the Fairmount water works at Philadelphia. As the Monongahela is a much larger river than the Schuylkill, and with a very sparse population as compared with that located upon its banks, it is on every sanitary ground to be considered a purer stream. I think, therefore, as far as the general river may be concerned, that its waters are as pure to-day as they ever were.

Second. Local or shore impurities, which may impair the quality of the water at the point from which it is drawn for the supply of the South Side.

Before speaking fully of the situation of affairs at the South Side water works, to which this question directly leads, it will be proper first to advert to Beck's run.

Beck's Run.—This run enters the river from the west or left side, about one mile above the water works. Its length is two miles and it drains not quite three square miles, or as compared with the Monongahela valley, it forms the $\frac{1}{2333}$ part. At the period of my visit to its mouth, April 14th, after several days of dry weather, it was discharging 200 cubic feet per minute, which, for the area considered, is a very strong flow. I think it probable that on that day more than half the discharge was made up of the waters from coal mines, for it left the peculiar sulphur, or iron, deposit over its bed which such water frequently does.

On the 4th and 5th of March, the dates to which particular attention has been called, there was a heavy rain. What the rainfall may have been in Beck's run valley I have no means of knowing, but for practical purposes we will consider the city record near enough. On those days, there was .37 inches of rain, viz: .08 on the 4th and .29 inches on the 5th, as reported by the United States signal officer. Such a rain would have precipitated in round numbers about 2,300,000 cubic feet of water in Beck's run valley. Assuming that two-thirds of this water was discharged into the river on the 5th, in the course of twelve hours, the stream was flowing then 6,400 cubic feet per minute, or 32 times its discharge of April 14th. Such a flow would fill a ditch ten feet wide and two feet deep, with a velocity of nearly four miles per hour. [These figures will give an idea of Beck's run when in a flood].

This large flow would of itself have very greatly diluted any sewage that might have been running in the stream.

There are ice-breakers, etc., in the mouth of Beck's run and below it, which deflect its volume far into the river, and cause its waters to be commingled with the river when at the water works for fully 175 feet from the shore.

As near as I can obtain, studying the matter from the chart of river observations, there must have been between five and six feet of a rise above the usual surface of the pool of dam No. 1, opposite Beck's run, coincidentally with the rise in that stream.

The sectional area of the river at the water works, with six feet rise, is represented by a width of 1,100 feet and 20 feet depth, the banks descending abruptly on both sides of the river below the influent pipes. Through this section of 22,000 square feet the discharge on March 5th, I have estimated, was about 3,000,000 cubic feet per minute. It would be safe, in my opinion, to say that the 6,400 cubic feet was at the water works intimately mingled with at least one-seventh of the entire river, or that it formed a part of 430,000 cubic feet per minute. In other words, it was there diluted 67 times its own volume, or taking the normal flow, which, as before stated, may be called 200 cubic feet per minute, it was diluted 2,150 times its own volume, or, again, considering that one-half of Beck's run is clean mine water, the residue, carrying sewage, was diluted 4,000 times its volume.

It is not my province to discuss the question as to whether great dilution will destroy the germs of disease, or whether a certain amount of time is required to oxidize them, or in fact to prove that such organisms really exist. But whatever the scientists say, the public have an abiding faith in ample dilution as a destroyer of them—for instance that portion of it residing at Sewickley, fourteen miles below Pittsburgh, where there is water works; but it is not well to shock the feelings of that respectable community with calculations of the proportion of sewage matter there may be in a tumbler full of Ohio river water. Great as it may be, it is to be hoped that neither the chemist nor the microscopist will ever detect it. There is an intermediate brook nearer up a sign "dirt wanted," the ash man will instinctively avoid that place. He seems to take a delight in dumping where the severest penalties "under the law" are prominently posted on the sign boards.

The South Side wards occupy a crescent shaped piece of alluvial ground, or river bottom, over two miles long, and measuring at the widest part about half a mile. Considering the fact that so much of this area near the river, having Carson street for its axis, is higher than that back towards the hill, it is natural to infer that at one period, not necessarily remote in a geological sense, the river passed at the base of the hill, and that Carson street marks the center of an ancient island. It is no uncommon occurrence to see bottoms along the Ohio and the Allegheny river highest near the water and low next the hills. This formation has been observed to originate by one chute of an island becoming suddenly choked up by an ice gorge, permitting drift to afterwards rapidly accumulate, which the muddy flood waters soon convert into arable land. This process of filling would be greatly expedited by slides from the hillside, as possibly happened in this instance.

But to whatever cause the original conformation of this ground may have been due, it certainly presented, at the time settlement was begun upon it, favorable conditions for easy drainage. But today it is, I think, as illy provided for in this respect as any considerable northern city with which I am acquainted. It is unfortunate for sanitary considerations that these wards remained so long as separate, independent boroughs, because the city has now much to do which should properly have been done in a gradual manner as the streets were built up.

In addition to ordinary culverts, simply intended for the purpose of conducting house sewage or storm waters, there are some parts which, in my opinion, will require special deep sub-soil drainage, provided cellars are to be permitted.

The cellars of all the houses on Twenty-fourth street, above Jane to Mary street, have water permanently in them. I observed one house where the water in the cellar was level with the street pavement. The filling of ashes, before mentioned, is no doubt the cause of the easy permeability of the soil. Is it a wonder, therefore, that in such localities the privy vaults are no sooner emptied than they fill up again? Yet there are some people who will see these things and not be convinced that the water of the wells can possibly be contaminated with the surface drainage or with excretal matters from the cess pool.

Possibly nothing is more conducive to easy under-ground flow than a stratum of coarse, granulated material, such as made by the particles of coke and ashes employed in the fill. It forms, no doubt, an excellent filter, and because it makes the water clear and cool, is very seductive.

I can only account for the collection of such large subterranean reservoirs of water, which rising, as it does in the particular instance cited, above the original surface of the ground, on the hypothesis that at some point the natural outlet to the river is impeded by an impervious dam, such as could have been made by a filling or reef of clay. A low bank at one of the street crossings might in the course of its construction have been gradually brought up in this manner with clay, as the surrounding lots were being filled with ashes, and this without the necessity for sub-soil drainage being particularly manifested. From Twenty-second street to Twenty-fifth street, between Josephine and Jane street, there was once an extensive pond, in fact it is not all filled up yet. Still no attempt is being made to drain the water. These lots are mostly vacant now, though laid off for building. Every cellar in them will probably stand with water at the height of the original pond.

The South Side Wells.—To properly understand the diagram representing a number of the wells, taken at random, it would be necessary in each case to describe its locality with reference to the distance from the river, elevation of water surface in well above the surface of the respective planes of the river above and below the dam, and the character of the ground, whether partially made or whether the excavation was entirely in the natural ground. But I think these details are not necessary.

The fifteen wells, with the possible exception of No. 7, on Josephine street, at the base of the hill, were all excavated in sand or loam, proving that the entire lower plane of the South Side is of alluvial formation. They are all bricked up and none of them ever go dry.

These wells may be divided into four groups:

First—Those along the river where the ground has been filled with ashes, garbage, etc. All such wells, in my opinion, are in direct connection with the river. Undoubtedly the river water is considerably clarified before it gets into them, but while it has dropped its load of clean river mud, it is natural to believe it must take into solution the noxious gases arising from the slow fermentation in process in the made ground. Wells Nos. 4, 5 and 14 come in this group.

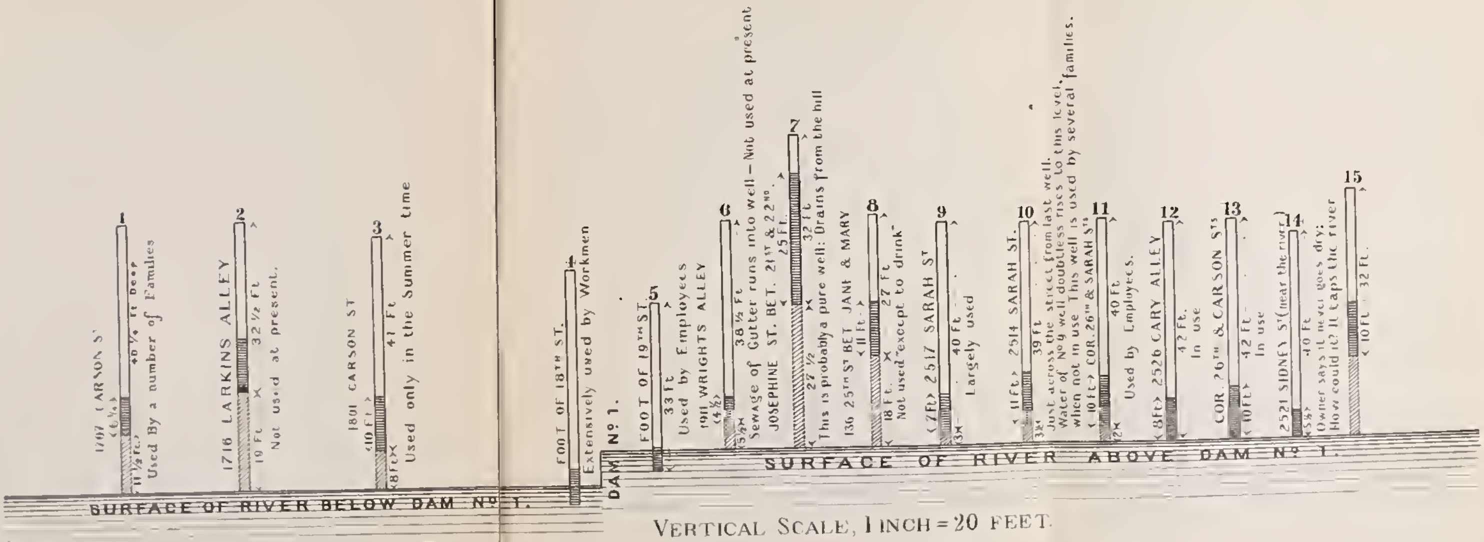

1
1707 CARSON St
(6¼)
11½ Ft.
40¼ Ft Deep
Used By a number of Families
2
1718 LARKINS ALLEY
19 Ft
32½ Ft
Not used at present.
3
1801 CARSON ST
10 Ft
8 Ft
41 Ft
Used only in the Summer time
4
FOOT OF 18TH ST.
Extensively used by Workmen
DAM No 1.
5
FOOT OF 19TH ST.
33 Ft
Used by Employees
6
1911 WRIGHTS ALLEY
(4½)
5½
38½ Ft
Sewage of Gutter runs into well — Not used at present
7
JOSEPHINE ST. BET. 21ST & 22ND
25 Ft.
27½
32 Ft
This is probably a pure well: Drains from the hill
8
136 25TH ST BET JANE & MARY
11 Ft
18 Ft.
27 Ft
Not used "except to drink"
9
7 Ft 2517 SARAH ST
3
40 Ft
Largely used
10
11 Ft 2514 SARAH ST.
3½
39 Ft
Just across the street from last well.
Water of No 9 well doubtless rises to this level,
when not in use. This well is used by several families.
11
10 Ft COR. 26TH & SARAH STs
2
40 Ft
Used by Employees.
12
8 Ft 2526 CARY ALLEY
42 Ft.
In use
13
COR. 26TH & CARSON STs
10 Ft
42 Ft
In use
14
2521 SIDNEY St (near the river)
5½
40 Ft
Owner says it never goes dry:
How could it? It taps the river
15
10 Ft
32 Ft.
SURFACE OF RIVER BELOW DAM No 1.
SURFACE OF RIVER ABOVE DAM No 1.
VERTICAL SCALE, 1 INCH = 20 FEET.

DIAGRAM *exhibiting fifteen wells taken at random.*
showing the elevation of water surface
in wells above the surface of the respective planes of the river,
above and below Dam No 1.

Second—Wells Nos. 9, 10, 11, 12 and 13, form a cluster in the made part of the city, the outlet to which is Twentieth street. They are all in one neighborhood, and I feel satisfied their waters would approximate a common level if suffered to stand for a period. If I am correct in this opinion, the water is not derived from springs, but is merely the seepage from the surface slowly percolating downwards and horizontally towards the river.

Third—Wells Nos. 8 and 15, I am inclined to believe, have been sunk into reservoirs of retained water, before alluded to; No. 2 may be a similar instance, but in the last mentioned case it is not apparent that the ground has been filled to any extent in the neighborhood.

Fourth—Wells Nos. 1 and 3, on Carson street, I would designate as island wells. They are not sunk in made ground, though I firmly believe obtain their water on the same principle as all the others. I believe that at a moderate depth water can be struck at any spot throughout the South Side wards. The fact that so many of these wells retain water in them several feet above the surface of the river can be explained, I think, on the principle of endosmose, which carries liquids upwards through finely divided or porous substances. Surface water will, in a reverse manner, descend until it meets a stratum of saturated material, such as is the sand at the bottom of these wells. I would not have it inferred that I regard all these wells equally bad. Some may be much more likely than others to receive rapidly the seepage from cess pools, etc. But considering the number of cess pools, doubtless five or six thousand within an area of less than one square mile, or at intervals almost as close together as orchard trees are planted, and the further fact of the permeability of the soil to water, there are few, if indeed any of them, which are beyond suspicion. The situation is far different here from what it is in other places, where there are legitimate springs issuing from strata deep down, and between which and the surface there are many layers of impervious rock. An artesian well several hundred feet deep, below any part of Birmingham, would probably develop wells of salt water, etc., without the slightest mixture with surface water.

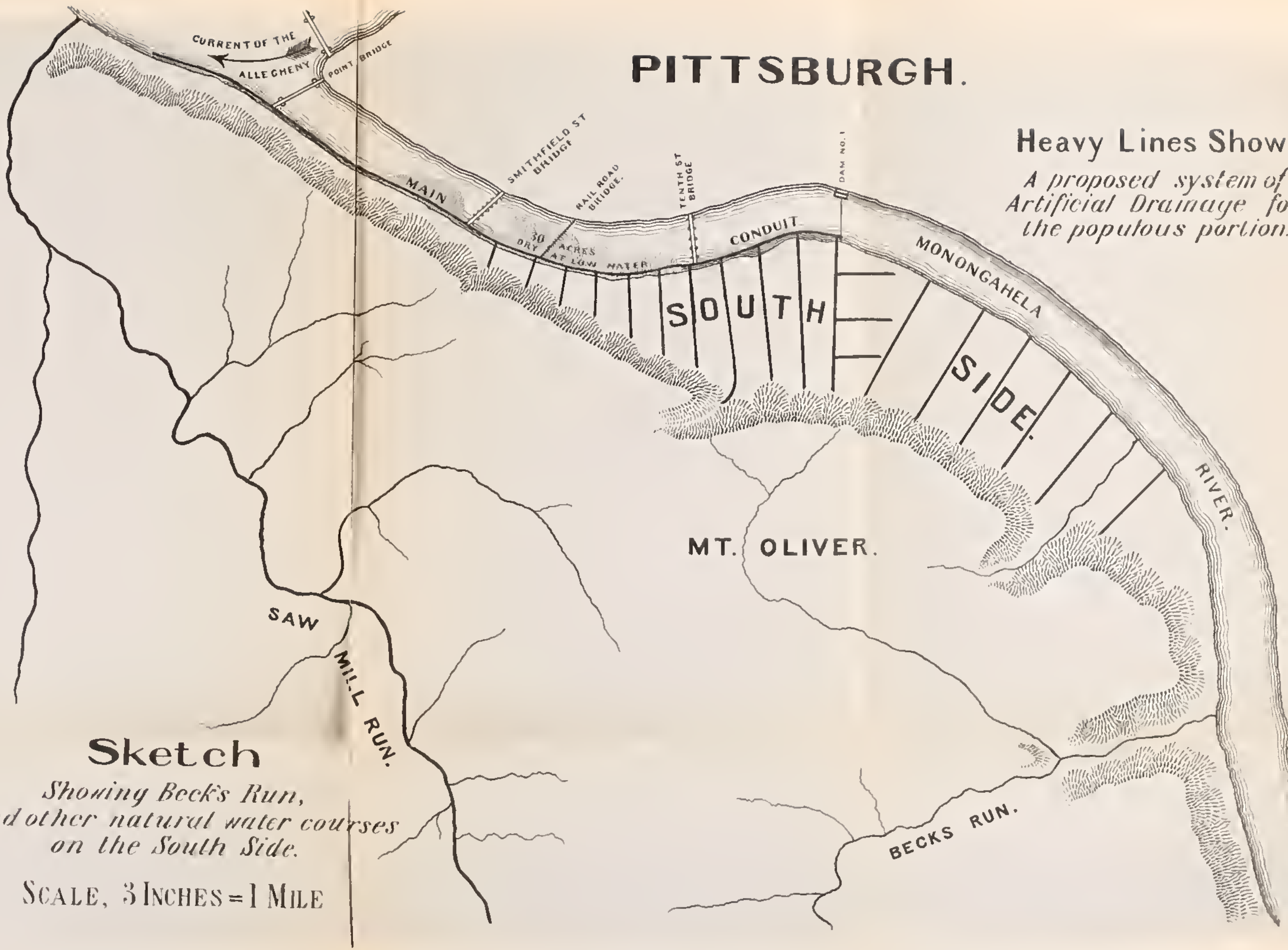
The River Front—In examining the river front of the South Side I observed many places behind the trestle work of the Pittsburgh & Lake Erie Railroad, where embankments have been pushed out into the river. Into the recesses between these spur embankments, the water flows back and forth as it rises and falls, and they form, particularly since the trestling was constructed, eddies or pond-like basins, in which there is no appreciable current.

There is no doubt, therefore, that the gutters and sewers discharging into these places must here deposit much of the garbage, excretal matter, etc., with which they are loaded. As the water recedes after a flood, the sewage follows it, and hence it results that the deposit is carried out and spread over large areas, where it is exposed to the sun and air, which hastens its decomposition. And further, not only are these interior recesses, thus coated over with an envelope of slime, but the process is continued later in the season with the decline of the river over the entire area of the great bars, embracing thirty acres, which make off the South Side shore in low water. There are times when the sewage from the South Side approaches to within 200 feet of the Pittsburgh shore, at Smithfield street. It must skirt the edge of the river always, and the South Side edge comes over that far at times. Consequently the entire area of the bar has been covered with sewer water, when, as evaporation proceeds, the usual up-stream wind must carry the effluvia into the heart of Birmingham.

This matter is important enough, in my estimation, to call for a remedy. I think the cost of bringing out the river front, or bank, of the South Side, in order that all the irregularities should be filled up, and a presentable river front made, would not be excessive. I would suggest, also, that intercepting drains be laid along both banks of the Monongahela, from dam No. 1 to the point, into which the sewage from the streets could be received. These intercepting drains could be connected with the pool of dam No. 1, which would furnish a hydrostatic head sufficient to flush them violently at any time. The current of the Monongahela, even now, is very sluggish, and those living on steamboats along the main wharf can testify to the foulness of the shore waters in the summer-time. But after the completion of Davis island dam, a discharge of 25,000 cubic feet per minute will create a current in the river of only 240 feet per hour, requiring more than a day's time to move from dam No. 1 to the point. I believe these improvements would conduce much to the advantage of the public health. It would require special surveys before the cost of such works could be determined more than approximately.

First—A survey of the streets and alleys of the South Side, with a view to exhibit the general topography, also the depth and area of made ground, with plans for drainage. In addition to this, it would be desirable to have specially examined and reported upon, the best means of draining certain portions, where from various causes, water now stands in subterranean reservoirs.

Second—A survey of the river front of the South Side, from dam No. 1 to the point bridge, in order to determine the cost of filling



Heavy Lines Show
A proposed system of Artificial Drainage for the populous portion.

Sketch

*Showing Beck's Run,
and other natural water courses
on the South Side.*

SCALE, 3 INCHES = 1 MILE

out the river bank to the established shore lines, sufficiently high to be above ordinary floods. To report whether this work could be done better by railroad, or by carting from the river bar, aided by dredge boats.

Third—A survey and report upon the cost of laying intercepting conduits down both shores of the Monongahela, from dam No. 1 to the point, having in view a connection of these conduits with the pool above the dam, from which a head can be relied upon for properly flushing them.

A survey, such as would be desirable for sanitary purposes of the South Side, should include:

First—A profile section of each street or alley leading from the hill side to the river, indicating the existing and proposed grade line; also as closely as possible the depth, if any, of made ground. These lines to be shaded to distinguish the above features.

Second—The same with other streets where sewers are now laid, and the sewers should be represented to scale with their inlets. The plan of each street inlet, drawn at one side. The datum of these two sets of profiles to be the zero stage of the Monongahela river.

Third—A general plan of the South Side in several large scale charts, sufficiently large to indicate, if necessary, outline or ground plans of buildings, in order to show the line of house connections. On these charts the made ground to be illustrated by shades of colors, and particular attention paid to marking distinctly by *color* and figures all lots or inclosures still below grade. All wells to be located and all privies within a radius of 150 feet of wells to be shown, with vertical sections of each.

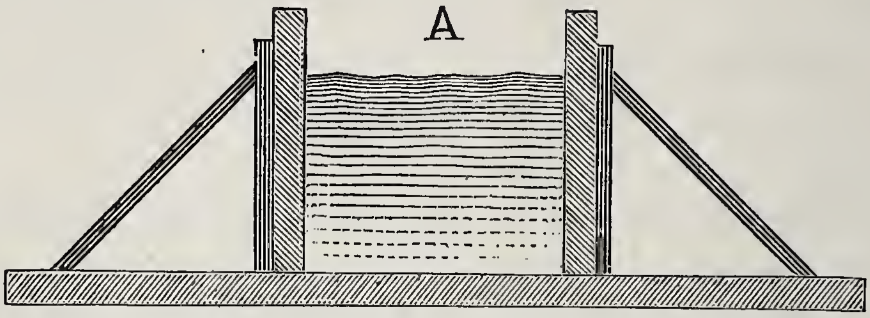
Fourth—A separate plan of the river front, from which calculations can be made of the cost of extending the embankments to the established lines.

Incidentally it might be mentioned that the survey should notice the present arrangement of streets and water pipes, as regards their size and depth below the surface.

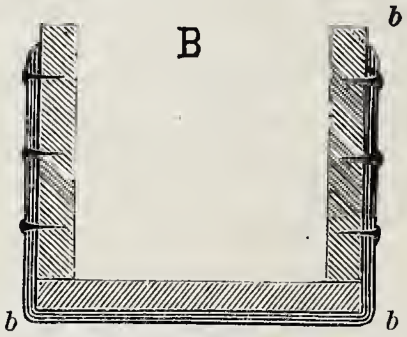
There are other things which will naturally occur to the engineer, which could be illustrated to advantage on their plans.

Of course the survey should be *exact*, and permanent bench marks should be left at convenient intervals, for future use when the sewers come to be made. It will therefore require much care, if it is to prove of any value in the future.

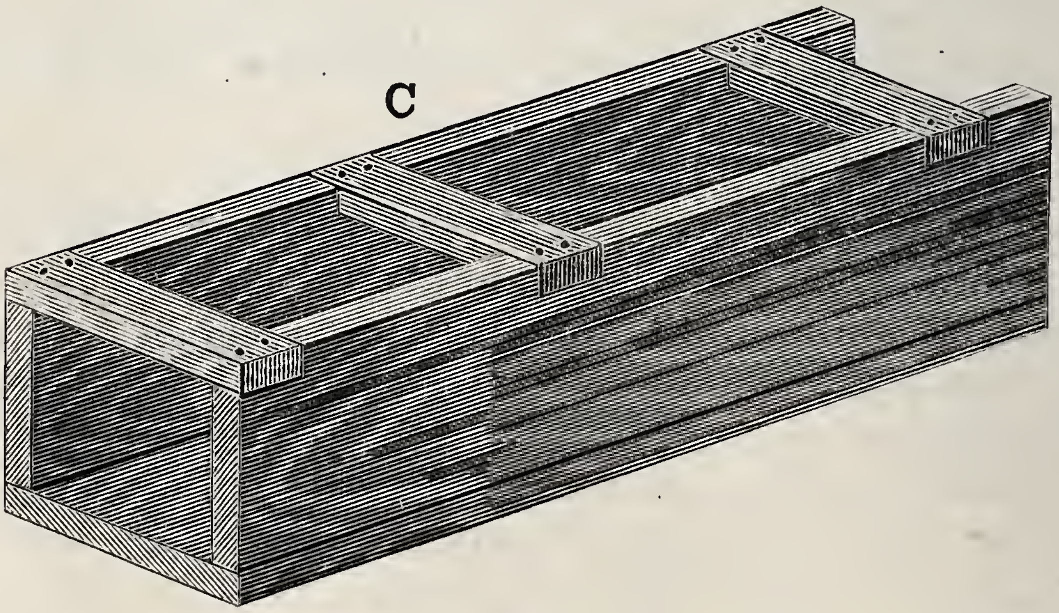
There never was a case requiring such a wholesale topographical and inquisitive survey in this city, simply because such work has been done in other portions gradually from time to time, as sewers were ordered. I might add, though out of place here, that I would suggest to the Board of Health the expediency of condemning cross braces on flumes or wooden conduits. These wooden troughs or "gutters" are very common in the upper part of the city. My complaint of them is that as now made, the brace catches large floating objects and makes it difficult to keep them clean. All flumes in the West, carrying water to mines, are made clear and open on top, for otherwise small twigs, leaves, etc., would soon choke them.



Plan *A* shows how they are built in the West, with *outside* braces. Here there would be difficulties in setting the braces, as the boxes are generally buried in the ground. I would suggest, therefore, in order to obviate the objectionable top cross brace, the employment of half round iron strips nailed or screwed to the *outside*.



B.—PROPOSED PLAN WITH IRON BRACE.—*b. b. b.*



C.—USUAL PLAN, WITH CROSS-BRACE, IN VOGUE ON THE SOUTH SIDE.

Respectfully submitted,
T. P. ROBERTS, C. E.

REPORT OF PROF. PHILLIPS.

WESTERN UNIVERSITY,
PITTSBURGH, May 28th, 1880.

Dr. W. J. Asdale, Chairman Special Committee, &c.:

SIR:—I present herewith report of analysis of water of the Monongahela river, and of the water of four wells on the South Side:

TABLE A.—ANALYSIS OF MONONGAHELA RIVER WATER.

FIGURES DENOTE GRAINS, PER UNITED STATES GALLON.

	1 River, No. 1, inlet pipe of water works, April 3d.	2 River, No. 2, inlet pipe of water works, April 5th.	3 River, No. 3, mid stream, 400 feet above water works, April 5th.	4 River, No. 4, above Beck's Run, May 8th.	5 Reservoir, April 3d.	6 Pittsburgh Hydrant, April 9th.	7 Croton water analysis here given for comparison, by Prof. Chandler.
Sulphate of lime, . .	1.322	...	...	...	...	...	0.158
Sulphate of magnesia,	0.508	...	...	...	...	...	...
Sulphate of potassa, .	0.055	...	...	...	...	...	0.179
Sulphate of soda, .	0.571	...	...	...	...	...	0.260
Chloride of sodium, .	0.178	...	...	...	...	.	0.402
Silica, ...	0.018	...	...	...	...	...	0.621
Carbonate of lime, . .	0.070	...	...	...	...	...	2.670*
Carbonate of magnesia,	Trace.	...	...	...	...	...	1.913*
Alumina and oxide of iron,	Trace.	...	...	...	...	...	Trace.
Total inorganic matter, .	2.722	...	...	...	...	...	4.11
Organic matter and water of hydration, . .	1.101	...	...	...	...	...	0.670
Total matters left on evaporation of one gallon,	3.823	3.890	3.787	Not determined.	3.910	...	4.78
Ammonia, "free," . .	0.004	0.005	0.0026	0.0003	0.006	0.008	...
Ammonia, "albuminoid,"	0.005	0.006	0.003	0.0003	0.005	0.007	...
Nitric acid, (in form of nitrates.)	0.001	0.0012	0.001	0.0010	0.002	0.003	...

*Calculated as bicarbonates.

The samples of river water were collected as follows:

No. 1, April 3d, from a point in the Monongahela river near the end of the inlet pipe, through which the reservoir is supplied.

No. 2, May 5th, from same point.

No. 3, May 5th, from mid channel, about 400 feet above the inlet pipe. A small but rather offensive stream flows into the river not far above the water works, and this third sample was taken fram a point sufficiently far up stream to be beyond reach of possible contamination from its waters.

No. 4, May 8th, from a point a short distance above the mouth of Beck's run, and consequently beyond the possibility of pollution from the city.

No. 5, April 3d, from reservoir at mouth of outlet pipe.

Column No. 1, in the table, contains a complete analysis, the results stated in grains per United States gallon. The purity of Monongahela river water, as regards mineral matters, may be appreciated on comparing its analysis with that of Croton water.

The quantities of lime and other salts dissolved are such as to entitle the Monongahela water to be considered exceedingly pure and well suited to household use.

Ammonia is present in all natural waters, being one of the products of the putrefaction of animal matters everywhere in progress.

In quantity it varies from undeterminable traces to about 0.01 (one hundredth of one) grain in the gallon, although the proportion may be greater in some cases. Much larger quantities of ammonia lead to the suspicion that the water is polluted by sewage.

Nitrogenous organic matters are also universally present, whether derived from natural sources or from sewage. All such matters are prone to undergo putrefactive changes, and to produce ammonia. No method is known for measuring directly the quantity of such matters, but advantage is taken of their proneness to change into ammonia, and in an analysis they are converted into ammonia, determined as such, and this ammonia is set down as "*albuminoid*" ammonia, to distinguish it from that which exists already as ammonia in the water. A very small quantity of 'albuminoid" ammonia probably represents a relatively large, amount of nitrogenous matters.

Nitrates are almost as constantly present as are ammonia, and mineral salts, in all water, and are regarded as the final product of the decay and oxydation of nitrogenous bodies. Although wholly unobjectionable in themselves, they are, when present in large quantity, to be considered as representing a corresponding amount of altered nitrogenous matter, and are to a certain extent a measure of former contamination.

On comparing the results of the examination of the four samples of river water, and one sample of water from the reservoir, it is seen that the character of the water from these different sources is not materially different.

The total solids in reservoir water appear slightly greater, the difference being probably due to the presence of a small quantity of sediment in the water examined. Water from mid channel, and above the water works, yields practically the same result. There is a slight but insignificant increase in the amount of ammonia "free" and "albuminoid" in the water of the reservoir over that in samples No. 2 and No. 3. The water above Beck's run contains a scarcely determinable trace of ammonia.

The proportion of nitrates does not increase appreciably.

The solid residue left on evaporation to dryness of one quart of either of samples Nos. 1, 2, 3, or 4, is nearly white, and when strongly heated, does not exhale an unpleasant odor.

In the event of fouling of the reservoir water, or contamination of the river water above the water works, leading to an accumulation of decaying organic matter, it would be reasonable to expect that some proof of such pollution would have appeared in the tabulated results of the analysis. A chemical analysis cannot lead to the detection of those particular elements of sewage which render a drinking water unsafe, but it may nevertheless show whether a water is charged with such putrefactive matters as go together to make up sewage in the widest sense of the term.

At the time when the water was collected from the reservoir, (April 3, 1880), everything about the reservoir bore evidences of cleanliness. The reservoir is small, and empties itself rapidly. The small quantity of sediment brought up from the bottom along the sides was wholly free from offensive smell.

In the absence of any probable source at any point of impurities not traceable by a chemical examination, I think it may be safely concluded that the river water supplied to city on the South Side is of a high degree of purity and excellence.

TABLE B.—ANALYSIS OF WELL WATER.

FIGURES INDICATE GRAINS PER UNITED STATES GALLON.

	WELL NO. 1.		WELL NO. 2.		WELL NO. 3.		WELL NO. 4.
	Sample No. 1, April 14th.	Sample No. 2, April 20th.	Sample No. 1, April 14th.	Sample No. 2, April 20th.	Sample No. 1. May 6th, 5 A. M.	Sample No. 2. May 15th. 5 P. M.	One sample, May 6th.
Total solids,	70.28	...	39.69	...	40.36	...	58.29
Chlorine,	7.32	...	3.19	...	2.60	...	6.92
Ammonia—"free,"	0.026	0.028	0.030	0.040	0.044	0.020	0.044
" " albuminoid,"	0.027	0.033	0.027	0.060	0.059	0.023	0.057
Nitric acid, probably as nitrate of lime,	2.120	...	2.880	3.560	2.360	1.450	7.210

A comparison of the total solids contained in these four waters respectively, shows them to be richly charged with mineral matters.

These are chiefly salts of lime and magnesia, and chloride of sodium. In the waters of Nos. 1 and 4, the proportions of solids (58.29 grains and 70.28 grains per gallon) would seem to render the water too hard for general use.

The water of all these wells is very clear, sparkling and pleasant to the taste.

The presence of a large amount of chloride of sodium in water is often of itself sufficient reason for suspecting its contamination by sewage. The wells on the South Side are, however, as a rule, so largely charged with saline matter, that no conclusion can be drawn from the amount of dissolved solids, as to purity.

Well No. 2 is thirty-two feet deep, penetrating six feet into a bed of sand. About thirty feet from the well is a cesspool, twenty-six feet deep. This well furnishes an abundant supply of water, which maintains a constant level, whether the well is drawn upon or not. The quantity of ammonia is rather large, but the quantity of nitrates considered in conjunction with the "albuminoid" and "free" ammonia renders it highly probable that the well receives putrefactive matters from the adjoining cesspool.

Well No. 3 is thirty-five feet deep, and is distant only twenty feet from a cesspool, which is six feet deep.

Well No. 4 is thirty feet in depth, and is more than 50 feet distant from the nearest cesspool. The water is remarkable for the large quantity of nitrates contained in solution.

The presence of such large amounts of nitrogen in all these well waters, together with the fact of their close proximity to cesspools, renders it highly probable that the water is constantly receiving drainage from the cesspools.

Respectfully submitted,
FRANCIS C. PHILLIPS,
Prof. Chem.

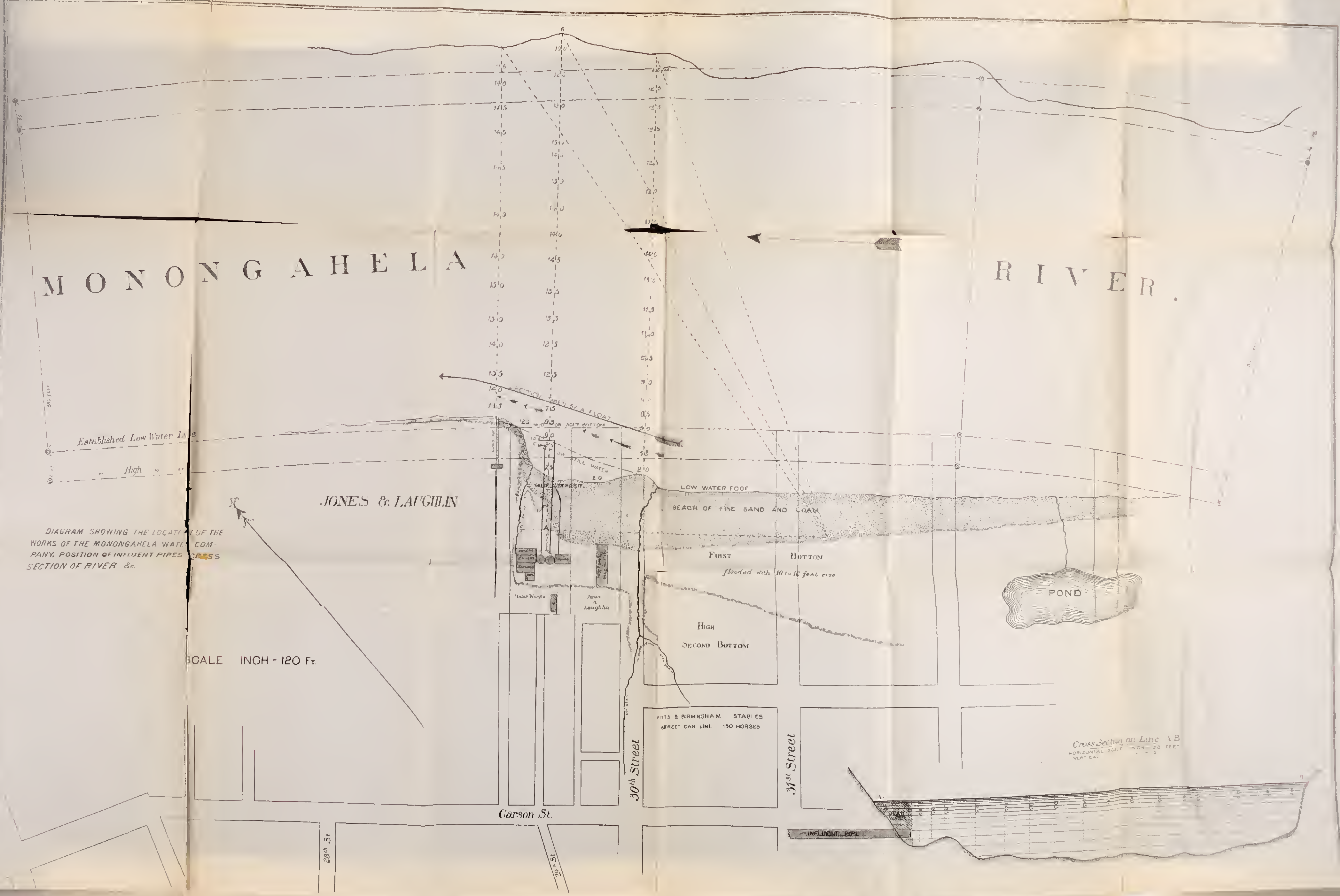


DIAGRAM SHOWING THE LOCATION OF THE WORKS OF THE MONONGAHELA WATER COMPANY, POSITION OF INFLUENT PIPES CROSS SECTION OF RIVER &c.

the water works and between it and Beck's run which was, no doubt, in flood at the time Beck's run was discharging its swollen waters. I am of the opinion that its waters would hold the shore inside of the Beck's run water, and would prevent at times any water from Beck's run entering the influent pipe of the water works.

The Water Works.—These works were built in 1864, at which time the shore extended nearly up to the buildings, but since the date of their construction the embankment of Jones & Laughlin, just below, have been so far extended into the river that the water works buildings are now left in a recess 300 feet back from the edge of running water. The influent pipes extend out from the building 300 feet, or about 20 feet inside of the corner of Jones & Laughlin's embankment, though there is some current in the "eddy," where the pipes terminate, just beginning to be noticeable. The soundings in the neighborhood of the end of the pipe show a muddy bottom. Even under twelve feet depth, the mud is a foot deep, and of a somewhat offensive odor, emitting gases when stirred up. This deposit is no doubt natural to the river in situations where eddies are created. It is quite possible, and indeed probable, also, that much offensive material deposits in this eddy from the Thirtieth street drain, which empties into the river only 200 feet above the pipe, and that some of it might easily be pumped up to the reservoir. From its proximity, I would regard the Thirtieth street drain as a much more likely source of contamination than Beck's run. It is quite likely that at times the water from the pipes would indicate no impurities, while at other times it might exhibit them in greater or less proportions, depending upon the stage of the river, when the Thirtieth street drain is in flood. For this reason I would advise the cessation of pumping for an hour or two during and after a sudden rain storm, which has washed down the streets, unless there be three feet of water on the comb of dam No. 1, when such a precaution might be ignored. But by all means, the pipes should be extended at least 175 feet further into the river. This, I believe, would carry it beyond any possible contamination by the water from Beck's run. I understand from the Superintendent of the water works, Mr. Stengel, that it is the intention of the company to extend the pipe, and in order to allay disquietude on the subject it should be immediately done.

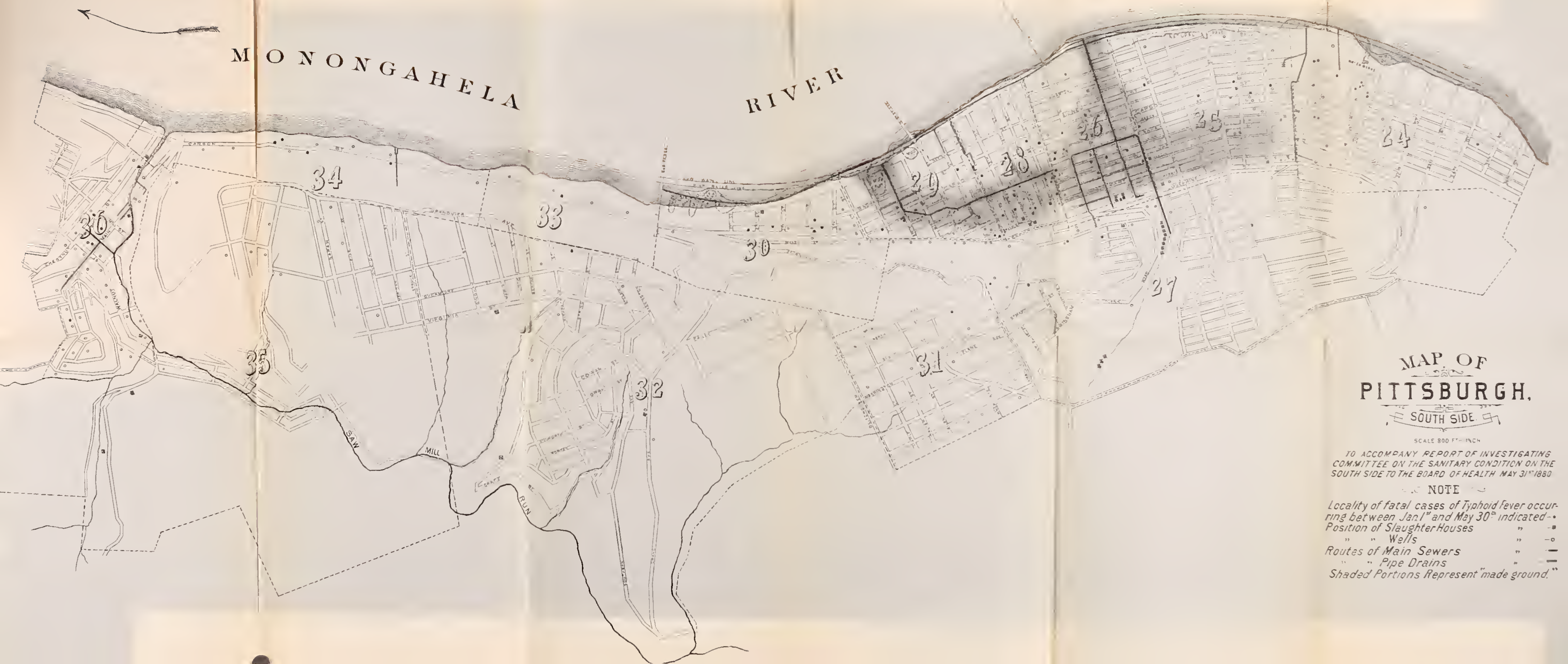
The South Side Wards—Nature of the Surface—Extent of Filled Ground, Etc., Etc.—It was not, as I supposed it might be, a difficult matter to determine the general area of made ground on the South

Side, though it would require an elaborate survey to trace the outlines in detail and give the depth of the fill with exactness at designated points. There are, even in the more densely built up portions of the town, occasional lots not yet entirely filled up, from which a good idea can be obtained of the depth of the surrounding fills. I might mention, also, that the original shape of the ground is to some extent indicated by the grade of the streets, but more is to be learned on this point by the direction of the principal sewers.

The line of Seventeenth street may be considered a divide on the line of highest ground which extended from the hill to the river, though I was informed there was from three to five feet of filling toward its upper end, from Sarah to Mary street. However, Seventeenth street, in the neighborhood of Jane street, must have been the divide separating the swales, or swampy runs, which *debouched* on the river at Eighth and Twentieth streets, respectively. In descending the axis of either of these ancient natural water courses, the filling will be found to increase in depth. The Eighth street—or more properly, Washington street—stream, received one or more tributaries from the hill. In the neighborhood of Ninth street, it formed what was once known as "Smoky Hollow," and there the maximum depth of fill was probably attained, viz.: 20 to 22 feet. The fill on Twentieth street in a similar manner, as it neared the river, attained a depth of about 20 feet—in the neighborhood of Sidney street.

It is, of course, quite impossible to determine even approximately the depth of the fill on the low grounds, where there were formerly brick yards, since even the localities from whence the clay was taken is a matter for argument. But there is no doubt that entire blocks were in this manner first excavated, and afterwards filled, thus increasing the depth of made ground over and beyond what it would otherwise have been. Roughly speaking, we may consider that 105 acres, or one-seventh of the entire area of the South Side above Smithfield street, exclusive of the extensive fills along the river front, stands on made ground.

If the present mode of making these fills can be taken as an index one would say that the material employed was for the most part ashes and cinders from the glass manufactories. A large proportion of it is composed also of waste material from cellar excavations, though throughout the mass of the filling, as it has been gradually brought to grade, there has been a considerable admixture of street scrapings, house ashes, filth and garbage. If the owner of a low back lot is desirous of having it filled and puts



MAP OF PITTSBURGH,
SOUTH SIDE.

SCALE 800 FT. = INCH

TO ACCOMPANY REPORT OF INVESTIGATING COMMITTEE ON THE SANITARY CONDITION ON THE SOUTH SIDE TO THE BOARD OF HEALTH MAY 31ST 1880

NOTE

Locality of fatal cases of Typhoid Fever occurring between Jan. 1st and May 30th indicated - •
Position of Slaughter Houses " - ■
" " Wells " - ○
Routes of Main Sewers " ▬
" " Pipe Drains " ━
Shaded Portions Represent "made ground."

Drainage and Sewerage.—By referring to the map it will be observed that of the eighty deaths marked thereon, thirty occurred within the boundaries of the "made ground" district, which covers an area of over one hundred acres, and through which pass the Washington street and the Twentieth street sewers. It will be remembered that in this locality, three years ago, diphtheria became endemic and caused a large number of deaths.

This made ground district is without question the most unhealthy locality in the city. The reasons for this are ample. The made ground covering it to a depth varying from one to twenty-five feet, is composed of material, much of which, as filthy ashes, garbage and refuse of all kinds, forms a very objectionable subsoil upon which to build a city. Its insalubrity is further aggravated by the fact that from one to a half dozen shallow cesspools, filled up and covered over can be discovered in many of the the back yards. This is owing to the fact that large portions of this district are saturated with water, which necessitates the construction of very shallow cesspools. There are also numerous springs having their source near the base of the hill, which, especially in the spring months, fill cellars with water and cause cesspools to overflow, thus thoroughly saturating the neighboring soil. The natural surface drainage, too, has, in some localities, been seriously interfered with, by the use of clay or other material impervious to water, in the grading of streets across original depressions of the surface, so that the streets are now acting as dams for the retention of large accumulations of subterranean water. These localities are numerous, and here the cellars are found to contain water.

There is a limit to which we can trust nature, but it must be apparent to the intelligent observer that the South Side wards have passed that limit, and she can no longer be trusted to remove the mass of impurities which the the dense population here imposes upon her. This condition of affairs can only be remedied by drainage and sewerage. The fact that, in previous endemics, the heaviest mortality followed closely the lines of the sewers, cannot be urged as an argument against drainage and sewerage upon the South Side.

The two great sewers, viz.: the Twentieth street and the Washington street, may be said to embrace the entire system thus far constructed. It must also be remembered that the route of these sewers is through the centres of the areas of made ground, and it must not be forgotten that they are called upon to perform a triple duty, viz.: in addition to soil drainage, they are supposed to serve, not only as conduits for the carriage of sewage proper, but in special emergencies, for the carriage of storm water also. While we are willing to admit the fact that their capacity (when not partially choked with debris) is amply sufficient for the performance of these varied functions, we are compelled to assert that their construction is in every respect faulty. The present large sewers upon the South Side might safely be permitted to serve the purpose of soil drainage, and to act as carriers of storm water, but sewage proper and the refuse from slaughter houses should be provided for in a very different manner.

We believe that there should be a distinct separation between the application of sewerage to the removal of house drainage, manufacturing wastes and soil water, and the construction of conduits for the removal of storm water.

This is the plan now being carried out in the city of Memphis, under the direction of Mr. George E. Waring, who presents the following terse arguments in favor of the exclusion of storm water from sewers proper. He says:

First—"The question of cost is so often the controlling question, even in improvements of the most vital importance, that the expense entailed by the construction of storm water sewers, often constitutes an insuperable obstacle to their construction."

Second—"The larger the sewer, the more difficult becomes the matter of ventilation."

Third—"Cases are extremely rare where sewers of the storm water size are not, at least during the dry and hot season, *sewers of deposit*, to such an extent as to have the air made most foul by the decomposition of their retained matters."

Fourth—Where the question of final disposal is important (as in the case of the South Side), the admixture of storm water with the sewage leads to the constant embarrassment of the system. The conveying of surface water to a depth of ten or fifteen feet below the surface seems to be at least unnecessary. Street wash can be safely admitted to sewers only after passing through settling basins, and these are sure to accumulate an offensive and dangerous amount of decomposing filth."

"One of the most important improvements we are destined to see is the removal of storm water, so far as possible, by surface gutters—carrying away the greater accumulations through very shallow conduits—largely, perhaps, through covered gutters easily accessible for cleansing and flushing."

"The new system, of course, requires that the streets be kept clean by other means than occasional drenching by rain storms. There is no more inefficient, costly and dangerous scavenger than the rain which falls upon the surface of our streets and which washes the dirt into the catch-basins at the street corners."

"No sewer should be of smaller size than six inches: (*a*) because it will not be safe to adopt a smaller size than four-inch for house drains, and the sewer must be large enough, surely, to remove whatever may be delivered by these; (*b*) because a smaller pipe than six-inch diameter would be less readily ventilated than is desirable; (*c*) and because it is not necessary to adopt a smaller radius than three inches to secure thorough cleansing of the channel by reasonably copious flushing."

"No sewer should be more than six inches in diameter until it and its branches have accumulated a sufficient flow at the hour of greatest use to fill this size half full, because the use of a larger size would be wasteful, and because when a sufficient ventilating capacity is secured, as it is in the use of a six-inch pipe, the ventilation becomes less complete as the size increases. The size should be increased gradually and only so rapidly as is made necessary by the filling of the sewer half full at the hour of greatest flow."

"The upper end of each sewer should be provided with a Field's flush tank of sufficient capacity to secure the thorough daily cleansing of so much of the conduit as from its limited flow is liable to deposit solid matter by the way. There should be sufficient man-holes to admit air for ventilation. They will not be necessary for cleansing, as the use of the flush tank will be a safeguard against deposit. The ventilating holes should be placed at intervals of not less than 1,000 feet. For the complete ventilation of the sewers it should be made compulsory for every property holder to make his connection without a trap, and to continue his soil pipe to a point above the roof of his house. All house connections should be through inlets entering in the direction of the flow, and these inlets should be flunnel-shaped so that their flow may be delivered at the bottom of the sewer, and also that they may withdraw the air from its crown; that is, the vertical diameter of the inlet at its point of junction should be the same as the diameter of the sewer. All changes of direction should be on gradual curves, and, as a matter of course, the fall from the head of each branch to the outlet should be continuous. Reduction of grade within this limit should always be very gradual."

"So far as circumstances will permit, the drains should be brought together, and they should finally discharge through one or a few main outlets."

We believe that upon the South Side, their outlets should connect with a larger—18-inch intercepting sewer, laid along the bank of the river, which would convey the entire sewage of the South Side into the Ohio river opposite the point, after the plan suggested by Mr. Roberts.

Upon the South Side it will be necessary, in addition to the removal of house-waste, to provide for the drainage of the sub-soil. "This should not be effected by open joints in the sewers; because the same opening that admits soil water—in dry seasons—and in porous soils, permits the escape of sewage into the ground, which is always objectionable. Soil water drains can easily be laid in the same trench with the sewers, and they should have an independent outlet."

The sytem of sewerage here described is radically different from the usual practice. We believe it is in all essential particulars much better adapted to the purposes of sanitary drainage. It is cleaner, is much more completely ventilated, and is more exactly suited to the work to be performed. It obviates the filthy accumulation of street manure in catch-basins and sewers, and it discharges all that is delivered to it at the point of ultimate outlet before decomposition can even begin. The limited quantity and the uniform volume of the sewage makes its ultimate disposal easy and reliable. The cost of construction as compared with that of the most restricted storm water sewers is insignificant. The expense will not exceed one-third the cost of construction of the old-style large, brick sewers.

We believe that upon the South Side, where six foot sewers are now deemed necessary, ten-inch drainage pipes are amply sufficient to rapidly carry off all that should enter them of true sewage.

We are confident that the more our citizens will study this matter. the more thoroughly convinced they will become, of the superiority of a system which makes separate provision for the disposal of sewage—of storm water—and for sub-soil drainage.

Slaughter Houses.—The business of slaughtering for the Pittsburgh market is conducted almost exclusively in private slaughter houses. Even the thickly populated districts are not exempt from these establishments. In the choice of locality private interests alone are consulted. On account of their large number, widely separated localities, and the irregular and unsystematic method of conducting the business, satisfactory inspection is an impossibility. There are private slaughter houses in the populous portions of the city, which, simply because of their *location*, are nuisances, and they will remain nuisances in spite of all remedies employed for their improvement.

With the exception, perhaps, of a portion of the Sixteenth ward, the South Side has more than its complement of these establishments, and an enumeration of the causes of the unsanitary condition of the South Side would be incomplete were we to omit mention of them.

There are on the South Side thirty-three slaughter houses. Of this number, eight are located in sparsely populated suburban districts and discharge their drainage into Saw Mill run. While these may not properly be considered "dangerous to the public health," they cannot but be regarded as nuisances by those residing in their vicinity.

The remaining twenty-five are, in our opinion, not only public nuisances, but positively "dangerous to the public health," for the following reasons:

Eighteen of them discharge their drainage into the Twentieth street sewer, four into the Washington street sewer, and two into the Twenty-seventh street sewer, while one is located near the bank of the Monongahela river on Second street. The condition of all these is, to an unprejudiced observer, shocking. Meats dressed and prepared for market in such places are liable to become tainted, simply on account of the absence of ventilation and of facilities for even a moderate degree of cleanliness. The defiling of drains and sewers with refuse and putrescible matters, with blood and the solid portions of animals; all these are powerful objections to the location of slaughter houses in, or draining through densely populated neighborhoods.

The throwing of solid animal matters into sewers is a most pernicious practice; one that should be dealt with in a summary manner by the enforcement of the most stringent preventive measures. Imagine the horrible condition, at certain points, of the interior of these large South Side sewers, which are, in a great measure, merely *sewers of deposit*, in which blood, grease, entrails, whole carcasses of hogs, calves, &c., are slowly undergoing decomposition, and constantly sending forth their unsavory emanations through every accessible opening. Is it a wonder that the residents of Twenty-first street and of Washington street, where there are no traps to the street openings, complain of their offensiveness? Yet there can be no remedy for this condition until these twenty-four slaughter-houses are driven from their present locations. The one located on Second street, near the river, while perhaps a greater nuisance than the others, is probably not so dangerous.

After careful investigation, and the consideration of all the facts bearing upon the subject, we are convinced that these twenty-five slaughter-houses, because of their location, manner of conduction, method of drainage and total unfitness for the business, both in material and manner of construction, should, in the interest of the health and welfare of the public, after due notice, be abolished.

The authorities should take decisive action in this matter.

On the grounds of public health and economy there can be no question of the superiority of public abattoirs over private slaughter-houses, a superiority acknowledged and acted upon in the city of Paris as long ago as 1810. This well-established fact has been appreciated, accepted and corroborated by a number of the large cities of this country. Chicago, Boston, New York, New Orleans Philadelphia, may be mentioned among the cities which have abattoirs in successful and satisfactory operation, and the experience of these cities might, were it necessary, be detailed to furnish fresh proof of the manifold advantages which the improved system of slaughtering possesses.

Under the present system of conducting this business, in the cheap and faultily-constructed, poorly ventilated and badly drained *shops* which are scattered throughout the city, no regulations can be prescribed that will remedy the evil. There is not a slaughter-house in this city but is regarded as a nuisance by those residing in its vicinity. There are but few of them that do not indirectly aid in the propagation of disease. There are but few of them from which unwholesome meat is not likely—perhaps unintentionally—to be furnished to the public, and there are but few of them that do not depreciate the value of surrounding property.

Other cities have demonstrated the fact that cheaper and better meats can be furnished under the abattoir system, which offers the only expedient by which an intelligent inspection, of the animals before being killed, and of the dressed meats afterward, can be made, and the sale of diseased or decomposed meats prevented.

Collection of Statistics.—Your committee appointed Sanitary Inspectors Bracey, McCord and Havis to the duty of visiting all localities of typhoid fever cases reported. The Inspectors were instructed to obtain the names, number of cases, sex, age, date of attack, character of case in respect to mildness or severity, manner of termination, other cases of sickness, description of surroundings, disposition of garbage, condition of cellar, source of water supply, condition of privy, manner of drainage, &c., together with such general information as they might be able to furnish, bearing upon the question involved. The Inspectors' reports are very extended, and although lacking in completeness, are exceedingly interesting in detail, but too lengthy for insertion here; a summary we elsewhere give. In brief, the reports cover 302 cases or localities visited. The whole number of cases of typhoid fever reported to the Health Office from the district south of the Monongahela river during the four months ending April 30, 1880, being 351. It should be noted here that this number is certainly considerably short of the total, for the reason that quite a number of physicians neglect or refuse to furnish this office with any account of such cases. From others, reports of cases are received, but at irregular times, and frequently long after their occurrence. The Health Office is thus dependent entirely upon the courtesy and promptness of those physicians who are concerned in the management of cases. Whilst the physicians in practice upon the South Side generally responded promptly in this instance, as they have hitherto done, there remain a considerable number of cases of which we have no account—we think it safe to say, about 20 per cent. of all. Unless some approximate be taken and used, error in the computation of the death rate must of necessity occur. We do not regard the proportion we have fixed upon as at all too great. With respect to fatal cases, we of course believe the account to be absolutely correct.

The chairman of your committee visited nearly all the reported localities of typhoid fever where fatal cases had occurred, taking cognizance of whatever of interest was presented bearing on the matter in question. Wherever possible, the families of the deceased persons, or those with whom they had resided were interrogated. Your committee also visited the locality of Beck's run, the stream to which reference had been made as being the possible source of contamination of the river and reservoir water. The outcome of this investigation as a whole, has been to your committee, and we doubt not will be to you, gentlemen, most satisfactory, contributing to an easy disposal, in our estimation, of the problem referred to us for solution.

Deaths from Typhoid Fever.—During the months of January, February, March and April of the present year, 89 deaths were variously certified to the Health Office as caused by typhoid fever, typhoid pneumonia, and typhoid dysentery. These deaths all occurred in the South Side wards. Deducting 7 cases of typhoid pneumonia, and 2 of typhoid dysentery, 9 in all, leaves 80 deaths which must be placed to the account of typhoid fever. Three of the 80 deaths occurred during January, 18 in February, 18 in March, and 41 in April. The localities of these deaths were as follows:

Twenty-fourth ward,	11
Twenty-fifth "	12
Twenty-sixth "	16
Twenty-seventh "	4
Twenty-eighth "	13
Twenty-ninth "	8
Thirtieth "	4
Thirty-first "	1
Thirty-second "	1
Thirty-third "	1
Thirty-fourth "	4
Thirty-fifth "	0
Thirty-sixth "	5
Total,	80

On examination it will be observed that with three exceptions, the deaths all occurred in those wards located on the flat or river district; further, it will be noticed that the wards 24th to 30th, and inclusive, furnished 68 of the 80. Examination of the record of the five years preceding 1880, gives the following as the number of deaths from this disease occurring in the wards mentioned:

Wards.	1875.	1876.	1877.	1878.	1879.	Total.
Twenty-fourth,	3	1	1	1	2	8
Twenty-fifth,	6	5	1	4	1	17
Twenty-sixth,	7	3	3	5	5	23
Twenty-seventh,	3	2	0	5	2	12
Twenty-eighth,	6	3	2	3	3	17
Twenty-ninth,	2	2	1	4	3	12
Thirtieth,	6	2	2	2	3	15
Total,	33	18	10	24	19	104

Number of deaths in the other twenty-nine wards of the city: 1875, 80; 1876, 61; 1877, 52; 1878, 83; 1879, 87=363. It is thus shown, that during the period stated the seven wards named supplied nearly one-fourth of all the deaths which resulted from this cause. In order that its prevalence in this locality may be more clearly understood, we have arranged in similar order a statement showing the number of deaths during the same period from this disease occurring in the old wards of the city, 1st to 7th, inclusive, viz.:

Wards.	1875.	1876.	1877.	1878.	1879.	Total.
First,	2	1	2	3	3	11
Second,	2	1	2	1	4	10
Third,	1	2	1	2	0	6
Fourth,	0	0	4	1	2	7
Fifth,	4	1	7	3	0	15
Sixth,	4	4	3	1	6	18
Seventh,	3	5	1	3	7	19
Total,	16	14	20	14	22	86

It is evident that typhoid fever has been an *habitue* of the South Side for several years past, and (it is too plain to be mistaken) its seeds have been thickly sown and widely disseminated, and that, too, in a most fertile soil. The natural outgrowth of such a combination of elements must be an eruption of the disease, and however tardy may be its appearance, it is nevertheless sure to come. It is not, therefore, necessary that we should seek for any other explanation of the recurrence of the malady with more than its usual force at the recent time than to know that favorable conditions of atmosphere and soil had existed to contribute to the solution and dispersion of the germs of the disease.

An examination of the meteorological chart for the period (January, February, March and April) will disclose nothing remarkable, except the very uniform mild character of the season, unusual, indeed, in this regard. Frequent and copious rainfalls occurred during the months of January, February and March, the heaviest being on the 13th of February, when 1.18 inches of rain fell; the next on January 2d, when 0.82 inches fell, and the next on March 27th, when 0.80 inches fell.

Typhoid Fever in Contiguous Localities.—Having reference to the possibility of the importation of fresh germs of the disease, their transportation by way of the river, and communication through the water supplied from the reservoir, your committee concluded to solicit information from medical practitioners resident in the up-the-river cities and towns, relative to the amount of typhoid fever present, or lately in existence, in their respective localities. Accordingly the following list of questions was prepared and sent to physicians in about twenty different localities on the Monongahela river above this city:

First—Did typhoid fever prevail extensively in your town or neighborhood during the month of March, 1880? Of February, 1880? Of January, 1880?

Second—From information received, do you think many cases came under the care of other physicians than yourself?

Third—How many cases came under your own care for treatment during March? February? January?

Fourth—How many cases terminated fatally?

Fifth—Did typhoid fever prevail more extensively in your town or neighborhood during the past winter than during any previous winter?

In answer to this, replies were received from six physicians in Brownsville, three in Monongahela City, three in Fayette City, two in McKeesport, four in Elizabeth, three in Braddock, and one each in Turtle Creek, Webster, California, Bellevernon and other localities. Almost without exception these answers indicated that typhoid fever in the various localities mentioned, had not only not been during the last winter and spring months more prevalent but that the disease had not been as common as usual.

Beck's Run.—Careful inquiry of those living along Beck's run, and throughout the district drained by that stream failed to show that the disease had been during the last fall or winter, more than usually prevalent. It is true, we found, as was represented, the privies attached to the houses, for about a mile along the run, and near the river, for the most part emptying into the run, but this insures against any accumulation of their contents. Every rise in the stream serves to wash out and away, all excreta deposited. This material has been, therefore, regularly so discharged, for an indefinite period, into the river as now. Further, your committee considering the distance removed from the city, of the locality of this discharge have not seriously considered the chance for contamination from this source of the water taken from the river to supply the reservoir. A vastly more dangerous amount, because enormously increased quantity of sewage has been and is yet being discharged into the Allegheny river in the near vicinity of the old pumping works, until recently used in supplying water to Pittsburgh, city proper.

Summary of Investigation by Sanitary Inspectors.

	NO. OF CASES.				AGE.					CHARACTER.					DATE OF ATTACK.																																		
																MARCH.																									APRIL.								
WARDS.	Males.	Females.	Not specified.	Total.	Under 5 years.	5 years and under 20.	Over 20 and under 50.	Over 50 years.	Not specified.	Mild.	Severe.	Fatal.	Not specified.	Total.	February.	4	7	8	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	Not specified.
24th......	15	22	4	41	2	23	10	...	6	19	13	3	6	41	...	...	...	...	...	...	...	...	...	...	1	2	2	...	...	1	...	...	6	...	1	6	...	4	...	...	2	2	...	2	1	1	1	...	9
25th......	21	17	34	72	2	28	8	1	33	20	13	4	35	72	1	...	...	1	...	...	...	...	...	...	2	...	6	1	1	1	1	4	7	...	1	2	1	2	1	...	2	2	2	...	...	...	...	...	34
26th......	30	26	11	67	...	35	22	...	10	33	15	7	12	67	1	...	...	...	1	1	1	...	14	2	...	4	1	3	2	2	1	...	2	4	...	4	...	1	...	1	3	3	1	...	...	1	...	1	13
27th......	8	7	12	27	1	9	4	1	12	6	5	4	12	27	...	...	...	...	...	...	...	...	...	3	...	1	1	...	2	1	1	...	2	1	...	...	1	...	3	...	...	...	...	...	...	...	...	...	11
28th......	18	18	11	47	4	23	8	...	12	17	17	4	9	47	...	...	2	...	2	...	1	..	1	...	...	1	11	...	...	...	...	...	4	1	1	2	4	...	...	...	2	...	2	...	...	1	1	...	11
29th......	5	13	2	20	1	13	4	...	2	6	8	3	3	20	...	...	...	...	1	...	...	1	...	1	...	...	2	3	2	2	...	...	1	2	...	...	1	1	...	1	...	...	...	...	...	...	...	...	2
30th......	14	14	...	28	...	21	6	...	1	15	10	2	1	28	...	1	...	...	...	2	...	...	...	...	...	...	...	1	1	...	6	1	3	...	2	...	4	...	...	...	1	1	...	...	1	...	...	...	4
Total	111	117	74	302	10	152	62	2	76	116	81	27	78	302	2	1	2	1	4	3	2	1	15	6	3	8	23	8	8	7	9	5	25	8	5	14	11	8	4	2	10	8	5	2	2	3	2	1	84

THE IMPORT OF THE PRESENT EPIDEMIC.

The work of the Sanitary Inspectors, we have summed in the foregoing tabular statement. It must be noted that while there were three deaths from typhoid fever during January, no reports of cases were received, evincing an apathy on the part of the profession and in the community in regard to the disease in question, but by no means establishing it as the fact that no cases had developed, for we find that in February, although the Health Office received notice of but two cases in existence, the mortality record shows that eighteen deaths occurred, and in the month of March, and *prior to the middle of that month*, eighteen more, proving that the disease was in existence and active operation before the date assigned to the beginning of the epidemic, March 15th. From the end of February to the 14th of March, sixteen cases of typhoid fever were reported to the Health Office. According to information received at the office, and verified by the Inspectors by visitation of the sick, fifteen persons were attacked on the 14th of March; thirty-nine on the 17th, 18th and 19th, and thirty-nine others on the 23d, 24th and 25th of March. Following the middle of March, reports were rapidly sent in, and we find, in the total of cases reported and visited by the Inspectors from the above date until the end of April, a fatality of twenty-seven; the remaining fourteen deaths necessary to make up the total of eighty, which occurred during the four months, occurring, of course, among those cases of which we received no reports. It will now be seen that our approximation is none too great. If, then, we add to the number reported, 351, one-fourth as many, representing 20 per cent. of the whole, we have, as designating the whole number of cases, 439. Out of this, the fatal cases to be accounted for are 41. This, it will be observed, is a low percentage of fatality, being 9.34, an unusually low death-rate applied to typhoid fever. It is important to notice, also, in regard to 216 cases of persons attacked, in which the exact age was ascertained, that the classes are as follows:

Under five years, - - - - - -	10
Five years, and under twenty, - - -	152
Twenty years, and under fifty, - - - -	62
Over fifty, - - - - - - -	2
Total, - - - - - -	216

Small, as the number is, it is evident that the portion (twelve) included in the first and last mentioned classes, viz.: under five years and over fifty, is an unusually large per cent. (.06) for these. Taken as a whole, and examined in reference to the various indications, an analysis of these cases, shows the epidemic, if exclusively one of typhoid fever, to have been of an unusual kind, involving more of the very young and the aged than is ordinarily observed, and as being attended by much less than the usual or average fatality marking such epidemics.

Fatal Cases.—We have before called attention to the fact that the locality of the greater number of the deaths was in a limited and specially-marked district, a district characterized by its fills, being in large part ground reclaimed from the swamp; a district in which all of the sewerage, such as it is, of the South Side, is located; where defective drainage and faulty house connections is the rule and not the exception; a district which has been of late years remarkable for its general unhealthfulness, having been the ground of conflict so recently occupied by the dread destroyer, diphtheria; a district in which rotten wood pavements can alone upon the South Side be found; where slaughter-houses, piles of garbage, manure heaps and ponds of stagnant water give forth their effluvia, rendering the atmosphere of the neighborhood noisome and noxious; and finally, a district which is remarkable as having within its bounds a larger number of wells (used and popularly held to contain a good quality of drinking water) than, we are sure we are not mistaken, the entire territory of the city outside. The wells are everywhere; the sewers occupy a limited locality—so with the hydrants; wells are found numerous where no hydrants can be seen and none are kept. Observation of these phenomena caused your committee to determine to ascertain, if possible (by no means an easy task), the extent to which well-water is and has been used. Accordingly, inquiry was made of those families where persons were known to have died of typhoid fever, this being the most reliable and direct route, in the minds of your committee, to an answer to the question. Satisfactory replies were in many cases not possible of attainment. Some had removed from the city, or to some part of the city to our informants unknown. Of the habits of others, nothing was definitely known, or could be ascertained. The following notes, being part of those taken on the ground, and verbatim replies to our interrogatories, will be read with interest:

F. H., aged 13 years; 16th street; died January 17, 1880. Worked at Lewis, Oliver & Phillips' mill; hydrant in yard, from which family use, except when it is too dirty, then we get a bucketful for drinking or cooking from some place; we go to 15th street, or to D.'s well.

A. H., aged 20 years; Carson street; died January 19, 1880. Sick 19 days. One other case in family: boy aged 14, recovered after seven weeks' illness. This girl had been working away from home and came home on a visit before the holidays; at home fifteen days before she took sick. The water used here is taken from the well near Singer & Nimick's mill. Boy worked at S. & N.'s mill; hands there drink the pump water.

A. W., 11 years; Carson street; died January 28, 1880. "My wife (says the father of above) is now sick, and as bad as can be, of typhoid fever. We have hydrant water in the house; we don't use the hydrant water when that water is muddy. I don't drink any water, but my wife has complained very much because of the dirty hydrant water—she would send to the spring or well—so many families send to the spring (above Carson street) that it is soon emptied; it is thought to be better water than the wells around Singer & Nimick's mill."

C. A. D., aged 21 years; Sarah street. Sick six weeks; died February 2, 1880; had been working at Redmondville; at home three or four days before going to bed. We have a hydrant which we use except when the water is too warm, when we go to E.'s or McD.'s well.

E. L., aged 19 years; Chestnut street; died February 4, 1880. Worked at Painter's mill. (Men there drink well water.) We have a hydrant, but go for drinking water to W.'s pump. We have a pump but don't use it; it is dirty water; it tastes and smells of the *back-house*. (Within a radius of about seventy feet from this pump there are three privy wells, located on higher ground at shallower depth than the pump-well, the nearest privy being twenty-two feet from the pump.)

A. R. E. H., school girl, aged 13 years; died February 12. Use hydrant water at home; don't know whether drank any other water at school.

C. M., aged 2 years; died February 19; sick twelve days. Use hydrant water; last summer they bought S.'s well water for ten cents a month.

J. F., aged 50 years; died February 21. Used water drawn from a well located about eighteen feet distant from cess-pool. Within the last two years there have been two other cases in same family, while living in this house. He worked at Singer & Nimick's mill.

S. H., aged 31, died February 21. Sometimes used water from N.'s well; prefer it to hydrant water when the latter is muddy.

D. A., aged 23; died February 9. For drinking water go to N.'s well.

J. C., aged 22; died February 27. Worked at Jones & Laughlins' mill until he took sick; use hydrant water except in summer, when we go to G.'s well for drinking and cooking water; we go there for water after rains or when the river rises.

J. S., aged 22; died February 28. Get all the water used in house from spring near Singer & Nimick's mill. The workmen in the mill all go to the pump for drinking water while at work.

R. No death, but case of typhoid fever, same location as above; water supply the same.

F. M., aged 17; died March 5. Ill thirteen weeks; worked at Painter's mill and drank the water there until he took sick; use spring water at home, which they say is excellent.

L. C., aged 24; died March 10. Use hydrant water generally, but it was very bad during my daughter's illness and previously. She complained of the bad taste of the hydrant water, and required them to go to the well at Evans & Co. for water.

M. K., aged 2 years; died March 17. Cellar is damp; well upon the premises, but we never use it ourselves, our neighbors use it for drinking water; we go to M.'s well for the drinking water we use in warm weather, or when the hydrant water is muddy; my husband took sick first with typhoid fever, but got well.

J. McC, aged 66; died March 22. Used hydrant water at home, except when it was muddy; would then get water from well at Evans & Co.'s.

B. K., aged 12; died March 22. Well in next yard which they occasionally use in warm weather or when the hydrant water is muddy.

A. M., aged 5 years; died March 28. Took sick with vomiting; died in nine days; use hydrant water; a small sewer opens in the yard just under the kitchen window.

C. H., aged 20; died March 30. Hydrant in yard; get water from the spring pipe which opens in the gutter on Eleventh street when the hydrant water is too bad for use; I was sick two months ago; was in bed two weeks.

F. W., aged 24; died March 30. Ill three weeks; worked at Jones & Laughlin's mill; we have hydrant in yard; when water is bad, we send to M.'s well.

M. D., aged 6; died March 30. Use well water.

E. H., aged 18; died April 1; sick two weeks. Never away from home; two others have been ill with same fever; no water in house; hydrant in yard; when hydrant water is dirty we send to W.'s pump; use well water for cooking and drinking.

C. H., aged 16; died April 2. Use hydrant water; cess-pool odor in cellar and throughout the house; noticed an unpleasant odor in March after the rains.

E. I., aged 13; died April 3. "No well upon the premises, but get what water we want from L.'s pump; we always use the well water when the hydrant water is bad and muddy."

D. F. S., aged 20; died April 3. Use hydrant water; after rains the water is very bad; a bucket full let stand over night will stink like a dead thing.

C. N., aged 24; died April 4. "Used spring water exclusively."

C. B., aged 29; died April 4. "Used well water exclusively."

R. C. S., aged 14; died April 5. "Used well water exclusively."

M. G., aged 19; died April 5. "No hydrant; go to F.'s well."

E. A. R., aged 29; died April 6. "Use hydrant water; use well in summer."

M. M., aged 16; died April 6. "When the hydrant water is bad we use spring water, because it is clear, cool and pleasant to drink."

A. S., aged 31; died April 6. "Ill twenty-three days; use hydrant water except when it is muddy; was using water from M.'s well when my wife took sick; I pay him ten cents per month for it.

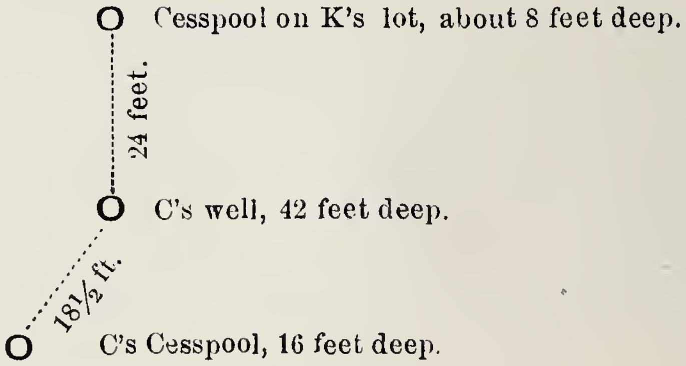
M. P., aged 20; died April 9. Lived with Mrs. W., who was taken sick the same day, but she recovered; after a rain, water covers the cellar floor; cellar is always damp; privy is twenty feet from kitchen; use hydrant water from next house; husband sometimes goes to the well for a bucket full; don't know where he gets it.

H. N., aged 11; died April 10. Use hydrant water in the house; sometimes send to J.'s well; use well water in preference in summer or when hydrant water is muddy.

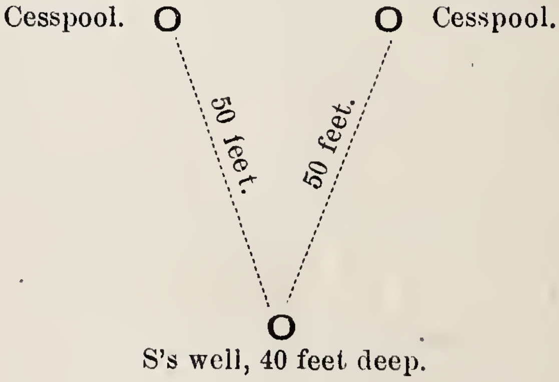
D. D., aged 25; died April 12. Cellar wet; well on premises which has not been used for several years; ashes have been thrown into it of late; use hydrant water in the house; he preferred well water, which he got at McKee's glass house.

R. D., aged 21; died April 13. All water used for drinking and cooking is drawn from C.'s well; we pay ten cents per month for it; the boys get water there for the shop.

C.'s well is forty-two feet deep; we never clean it out; can't do it; we had four men working for two days and they could not get the water down to nearer than five feet of the bottom; our well is used a great deal; I charge ten cents a month to my neighbors; we don't use our well much in the winter, but during the spring and summer months.


Cesspool on K's lot, about 8 feet deep.
24 feet.
C's well, 42 feet deep.
18½ ft.
C's Cesspool, 16 feet deep.

Mrs. S.'s well is just across Centre alley from C.'s; can't empty it of water; it has not been cleaned (says Mrs. S.) for two years; my well is used a great deal; we charge ten cents a month; we, last summer, wore out a new rope; it is used from morning until night every day; there is a great deal of water drawn from our well now; our tenants use it entirely all the year; we have no hydrant water; W., a member of this family, died April 1, aged 34, get water here, and our neighbors commence drawing from our well in April, but they come at any other time when the hydrant water is bad.



W., aged 9 years, (member of same family,) taken sick. "We have no hydrant; no water in my house, or on my lot; I have the privilege of using

S.'s well, as long as I want it, as I sold them the property; the cess-pool on the property is full and its door is within ten feet of the kitchen window."

H., "Taken sick March 17; twenty-four days in bed; hydrant water here; the water is bad sometimes; after a rain it is thick with mud, and has something stinking in it; we don't use it for drinking; we go to S.'s; he don't charge us anything for water, but he charges others; this spring, when the heavy rains came, we couldn't use the hydrant water at all; we quit using it entirely and went to S.'s; S.'s well is forty-seven feet deep; it takes a man constantly at the pump to clean the well out; I cleaned it about one month ago."

L. B., aged 15; died April 14. Worked in Evan's & Co.'s glass works; used well water.

F. L., aged 15; died April 15. Use hydrant water; when it is not fit to use we go to C.'s well.

L. M. B., aged 18; died April 16; ill four weeks. Have hydrant in yard from which we use; when my son was sick, we at his request, brought water from a well for him to drink.

J. C., aged 66; died April 19. Had been subject to diarrhœa; use hydrant water when it is not too muddy; we then get water from M.'s well, for which we pay ten cents a month; when the water was bad this spring, we got all the water we wanted for drinking and cooking from M.'s well; a year ago my son had typhoid fever; my grand-daughter has lately had it also.

T. O., aged 8 years; died April 19; we use water from K.'s well; we pay ten cents a month for all we want for cooking and drinking; hydrant water is dirty and stinking, and becomes thick after rains.

C. S., aged 21 years; died April 21; use hydrant water generally, but when it is muddy we get well-water, sometimes at Keelings, sometimes at Evans & Co.'s; the children pay for it.

C. O. B., aged 7 years; died April 23; sick 11 days; yard full of filthy offal, and privy-well full to seat; use hydrant water except for drinking; for that we send to M.'s well; she don't charge us anything; last summer we bought well-water from M.'s at ten cents a month.

B. C., aged 24 years; died April 26; hydrant water was so bad that we put a new pump in the well, and used that; we have hydrants for our tenants; we use no hydrant water ourselves for drinking; we use well-water; it is good water; we allow all our neighbors to come, and we don't charge them anything for it.

Of seventy-five families visited, the use, occasionally or exclusively, of well-water, was admitted in forty instances; in half as many, its use was denied, and in the remaining number no definite information in answer to this question could be obtained. In explanation of the seeming too large a number included in the class last mentioned, we would state that these were principally men or boys who had worked in some locality not ascertained, or if ascertained, we could not be certain, from answers received, whether the use of well-water had been the custom or habit, occasionally or regularly, with the individual or not. But enough has been learned to satisfy your committee that the use of well-water has been a most potent *and the most* important factor in the product of cases of typhoid fever lately in existence in the South Side wards.

We shall not attempt to dispose of the whole number of cases of sickness reported as typhoid fever, as such. Reports received from the South Side physicians who were chiefly engaged bear us out in the conclusion that many of their cases were not those of typhoid fever. Dr. Duff remarks the variable character of the cases; the proneness to relapse in many; the early convalescence in others; the fact that neither infants or the aged possessed immunity; previous attacks were no bar; conditions usually not observed were involved, as pregnancy, &c.; diarrhœa was not so commonly present as is the rule; and in other minor points differences were observed.

Dr. Thomas says: "Sixty-nine per cent. of my cases were from two to twelve years of age, inclusive." Dr. Koeller says: "The largest number of my typhoid fever patients had a mild attack. The most cases were from the age of two to eighteen years." Again, "In my cases (forty or fifty) the diagnosis was intestinal catarrh—half of them. Had only five severe cases of typhoid fever, of which three died.

Dr. Wood says: "An unusually large proportion of children were affected; the average duration of my cases, twenty days. Diarrhœa prevalent coincidentally."

Unfortunately for exactness, no post-mortems were made. This we regret, although we do not doubt that in almost if not all of the fatal cases the lesions peculiar to enteric fever would have been found, had autopsies been secured. Your committee conclude that typhoid fever existed to much more than the usual extent during the recent months in the South Side wards, and unanimously agree that this arose from the use of well-water in an unusual amount, at an unusual season, and without the customary precautionary bailing or pumping-out, at a time when the water contained in these wells was surcharged with those poisonous elements always present but ordinarily less dangerous because more diluted. That the water in the wells of the flat or river district of the South Side is almost without exception polluted, we unhesitatingly affirm, and although we are ignorant of how far it is possible to drink human excrement without incurring disease, or to what degree of dilution it must be reduced to avoid the danger of specific disease, we know that in drinking it at all there is *always a risk.* This proposition should require no demonstration. The great depth of many of the cess-pools found prevents the oxidation of the filthy matter deposited in them, but held there in mixture it becomes liable at any time, especially during a season such as that of the last winter, characterized by its frequent and copious rains, to contaminate the water in drinking wells within a distance of several hundred feet around each privy. Cess-pools at shallow depth yield their effluvia to the atmosphere and contaminate the wells to a smaller amount. We are further inclined to the belief that simultaneously a large number of cases of illness occurred which we will, because of its lack of identity, and because of its similarity to typhoid fever, and finally, because we lack a more expressive or truthful term, designate as pseudo-typhoid. We believe these cases last mentioned may be honestly attributed to the use of the river water at that time, or to the use of water from wells which, while full of impurities derived from excreta, *i. e.*, cesspool seepage, yet lacked the presence of the specific typhoid germs.

Intestinal catarrh, and a condition of disease closely simulating enteric fever, or that which is popularly named typhoid, and which is now believed to be a specific form of disease, and which, if such, must be dependent upon its specific cause, has frequently been observed to originate in the use of drinking water contaminated by sewage. An instance which should be well known and fresh in the memories of those living in this vicinity is that of the epidemic in 1874–5, at the Western Pennsylvania Reform School, at that time located on the Ohio river below Allegheny City. There, also, those attacked, almost the entire household, were nearly exclusively the young. The cases were for the most part of short duration, and the mortality light (less than five per cent.) Other examples in kind might be multiplied indefinitely.

Of course, not all the cases are meant to be included as having their origin in or through the use of infected or unwholesome drinking water. Your committee unmistakably recognized in several instances the evidence that sewer or privy emanations escaping into dwellings was the probable cause.

In conclusion, your committee recommend the following propositions:

1st. That the Board of Health recommend the Councils of the city to require the Monongahela Water Company to extend their supply pipes to mid-river, and to enlarge the capacity of their basin, providing for precipitation or deposit from the water before permitting its use; or so order that an increased supply of pure water shall be regularly and continuously furnished to the people of the South Side.

2d. That the Board of Health recommend Councils to order an elaborate and critical survey of the South Side, with a view to exhibit the general topography; also, the depth and area of made ground, with plans for drainage. Also, a survey of the river-front of the South Side, from Dam No. 1 to the "Point" bridge, in order to determine the cost of filling out the river bank to the established shore line sufficiently high to be above ordinary floods. A survey and report upon the cost of laying intercepting conduits down both shores of the Monongahela from Dam No. 1 to the "Point," having in view connection of these conduits with the pool above the dam, from which a head of water can be relied upon for properly flushing them.

3d. That the Board of Health request Councils by ordinance to establish the office of Sanitary Surveyor, to be filled by a competent person, to be appointed by the Board of Health, and be subject to their control, whose duty it shall be to supervise and direct the construction and repair of all sewers, and to supervise the construction of all house-drains or pipes connecting with sewers, and without whose permit, advice, supervision or authority no person can or shall be authorized or permitted to make any such connections.

4th. That Councils be urged to establish by ordinance a systematic method providing for the thorough and regular removal of ashes, garbage and offal, under the supervision of the Board of Health.

5th. That the Board of Health earnestly petition Councils to order the abandonment and closing of all drinking-water wells in all suspicious localities.

6th. That the Board of Health petition Councils by ordinance to order the construction of one or more "abattoirs," or general slaughtering establishments, and require the abandonment of the present slaughtering-houses at a time as early as expedient.

Respectfully submitted,

W. J. ASDALE, M. D.
W. SNIVELY, M. D.
T. P. GRAHAM, M. D.
Committee.